CITY OF MANCHESTER.

REPORT

ON THE

Health of the City of Manchester,

1895.

BY

JAMES NIVEN, M.A., M.B.,

Formerly Fellow of Queens' College, Cambridge.

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Public Health Office,
Town Hall, Manchester,
September 9th, 1896.

To the Right Honourable the Lord Mayor and the Corporation of the City of Manchester.

My Lord Mayor and Members of the Council,

I have the honour to present you with the Annual Report on the Health of the City of Manchester for the year 1895. The Statistics for the year, which are discussed in the first part of the Report, do not offer much subject for congratulation. When they come to be discussed in detail, in the light of a knowledge of the individual cases of fever, and of the conditions of excreta collection and removal, an accumulation of indications present themselves pointing to those conditions as operating decidedly in the production of a high death-rate.

I would respectfully request your attention to the sections dealing with Scarlet Fever, Diphtheria, and Enteric Fever.

The more intimate relations about to be established between the Health Office and Monsall Hospital will doubtless enable us to observe more clearly, and to exercise more control over, the influences affecting the propagation of these diseases.

The establishment of a definite provision for Smallpox remains under consideration.

I have ventured to request the Corporation to take steps to get certain cases of Tuberculosis included among the diseases to be notified to the Health Office.

The continuation of the work of the Office in respect of bakehouses is dealt with in a short report. The successful and beneficent operations of the Sanitary Committee in respect of back-to-back houses continue, and the tenements in the Oldham Road and Pollard Street Dwellings are now full.

The present condition of Common Lodging Houses is bad in the extreme. No better way presents itself for the removal of the evils at present inherent in these than the erection of Model Lodging Houses on the best modern principles.

The new regulations in respect of Cowsheds and Milkshops, if adequately enforced, as we may hope that they will be, with the aid of the new Veterinary Staff, will doubtless effect an improvement in the quality of the milk produced in the City, and it is hoped that means will be found to influence the production of milk outside our boundaries.

A great acceleration of much-needed drainage work, of the highest quality, has occurred under the new House Drainage Department.

I have to thank Dr. Marsden of Monsall Hospital, Mr. A. T. Rook, Mr. James King, M.R.C.V.S., Mr. R. D. Callison, Mr. G. M. Moyes, and Mr. A. W. Lawson for brief reports on that part of their work which has special relation to the Health Department; and I am indebted to my Clerks, especially to Mr. T. L. Ellwood, for their careful and ungrudging aid.

Thanking the Council for their continued support, and my colleagues for their cordial co-operation,

I have the honour to be,
My Lord Mayor,
Your obedient Servant,
JAMES NIVEN,
Medical Officer of Health.

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REPORT.

VITAL STATISTICS.

In a City of such magnitude as Manchester, there is a constancy of relation in the principal statistics which renders it valuable to follow closely the annual figures for a number of years.

In the year 1894 the birth-rate reached the very low figure of 31·8 : a figure only attained before in 1890. The marriage-rate, however, was in advance of that recorded in 1893, and it was likely, therefore, that some increase of prosperity, whether from revival of trade, or cheaper provisions, had affected the community. It was possible, also, that the various favourable conditions which so much reduced the death-rate might have had some effect on the marriage-rate.

In 1895, however, the marriage-rate still further increased from 16·8 in the previous year to 17·4, being the highest figure which it has reached since 1884, and the birth-rate rose from 31·8 per 1,000 living in 1894 to 33·4. We may, therefore, conclude that the material well-being of the citizens generally has undergone improvement.

The rate of mortality allows of no such cheerful reflection. In 1894 the Manchester recorded death-rate was below that of five towns. In 1895 it is exceeded only by those of Liverpool and Salford, whether we take recorded or corrected death-rates. If we balance the gains and losses in 1895, we find that there is a net loss, so far as the natural alteration of the population is concerned, of 2·1 per 1,000, making a net loss of over 1,000 lives, as compared with the previous year. The actual death-rate is 24·5, which is higher than the figures for the previous three years.

If we compare the corrected death-rate with that of England and Wales generally, we find that there is a difference of over 9 per 1,000, representing on our population a difference of over 4,500 lives, or, as compared with London, a difference of over 3,000 lives. The figures for the 33 large towns are given in the following table :—

TABLE I.—RECORDED AND CORRECTED DEATH-RATES PER 1,000 PERSONS LIVING IN 33 GREAT TOWNS DURING THE YEAR 1895.

TOWNS in the order of their Corrected Average Death-rates	Standard Death-rate	Factor for correction for Sex and Age distribution	Recorded Average Death-rate, 1895	Corrected Death-rate, 1895	Comparative Mortality Figure, 1895
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
England and Wales	19·15	1·0000	18·71	18·71	1,000
England and Wales less the 33 Towns	19·45	0·9845	17·68	17·41	931
33 Towns	17·71	1·0813	20·65	22·33	1,193
Croydon	18·37	1·0424	14·47	15·08	806
Portsmouth	18·73	1·0224	17·83	18·23	974
Derby	17·36	1·1031	16·70	18·42	985
Norwich	19·99	0·9579	19·34	18·53	990
Leicester	17·64	1·0855	17·24	18·71	1,000
Bristol	18·33	1·0447	18·06	18·87	1,009
Brighton	18·94	1·0110	18·88	19·09	1,020
West Ham	17·75	1·0788	17·87	19·28	1,030
Plymouth	19·70	0·9720	20·11	19·55	1,045
Huddersfield	16·47	1·1627	16·88	19·63	1,049
Swansea	17·53	1·0924	18·27	19·96	1,067
Cardiff	17·16	1·1159	18·21	20·32	1,086
Nottingham	17·81	1·0752	19·02	20·45	1,093
Gateshead	17·83	1·0740	19·58	21·03	1,124
London	17·97	1·0656	19·85	21·15	1,130
Birkenhead	17·42	1·0993	19·53	21·47	1,148
Halifax	17·20	1·1133	19·29	21·48	1,148
Hull	18·23	1·0504	20·84	21·89	1,170
Newcastle	17·58	1·0892	20·48	22·31	1,192
Birmingham	17·33	1·1050	20·28	22·41	1,198
Leeds	17·28	1·1082	20·49	22·71	1,214
Bradford	16·73	1·1446	19·85	22·72	1,214
Sheffield	17·22	1·1120	20·46	22·75	1,216
Sunderland	18·25	1·0493	21·79	22·86	1,222
Oldham	16·72	1·1453	21·97	25·16	1,345
Wolverhampton	18·30	1·0464	24·38	25·51	1,363
Preston	17·42	1·0993	23·89	26·26	1,404
Burnley	16·67	1·1487	23·38	26·86	1,436
Manchester	16·90	1·1331	24·51	27·77	1,450
Bolton	16·90	1·1331	23·96	27·15	1,451
Blackburn	17·05	1·1231	24·30	27·29	1,459
Salford	17·03	1·1244	25·65	28·84	1,541
Liverpool	17·26	1·1094	28·79	31·94	1,707

In considering this high death-rate, our first step is, necessarily, to examine its component elements, in order to see where the increase over previous years chiefly lies.

If we refer to Table B, we find that the number of deaths is decidedly greater in 1895 than the average for the years 1891-94, in miasmatic diseases, in diarrhœa, in constitutional diseases, in circulatory, and in respiratory diseases. The only important per contra is in diseases of the nervous system. By far the largest individual increase is in diarrhœa.

By reference to Table G, we find that, as compared with the average of 15 years (1881-95), 1895, in common with other recent years, shows an increased death-rate from cancer, and a slightly diminished rate from tubercular diseases. The death-rate from phthisis, it is grievous to record, is above that of the previous three years. From diseases of the nervous system there is a marked diminution. From heart disease and from lung disease, on the other hand, the death-rate is slightly higher than the average for the fifteen years. Finally, it is pleasing to observe that there is a distinct diminution in the deaths incidental to child-bearing, and that, in this particular, 1895 shows an advance even on 1894.

Except, therefore, in respect of diseases of the nervous system, there is no marked improvement in any class of disease. This improvement may, possibly, be assigned to the effort which has been made to improve the methods of infant feeding, and is to be found principally under the heading " convulsions."

If, now, we compare the causes of death in 1895 with those of 1894, and of the years 1891-93, in greater detail, we shall be in a position, perhaps, to form a better estimate of what are the constant and what the fluctuating diseases, as also what are preventable and what are not, with our present knowledge and administrative means.

And, first, as regards miasmatic disease, the deaths are :—

From	In 1891	1892	1893	1894	1895
Measles	220	369	293	222	505
Scarlet Fever	114	139	140	116	173
Diphtheria	122	91	122	102	72
Membranous Croup ...	6	39	60	47	41
Enteric Fever	189	124	127	91	95
Smallpox	0	2	49	21	2
Influenza	347	140	120	45	194
Whooping Cough	518	368	240	286	250

It will be seen that the chief excess in the past year from this class of disease occurs in measles, although there is also an excess under scarlet fever. To some extent the significance of this is diminished by the smaller number of deaths from diphtheria, since it is probable that many cases classed as diphtheria are, in reality, scarlet fever.

There is also a marked increase under the heading "influenza" over the previous year, although the number of deaths does not equal the average in 1891-93.

From whooping cough, in 1895 there are fewer deaths than in 1894, and the advantage gained in typhoid fever in 1894 is continued.

When, now, we pass on to diarrhœal diseases, we are again met by a marked excess, the number of deaths being 904 in 1895, as against 375 in 1894, and an average of 602 in 1891-93. The subject of infantile diarrhœa will receive separate treatment.

There is, thus, a marked excess of deaths from the ordinary infectious diseases and from diarrhœa. But this excess does not extend to those diseases which come more especially under the control of the Health Department, viz., scarlet fever, diphtheria, membranous croup, enteric fever, and smallpox, the total deaths from these causes being in

1891	1892	1893	1894	1895
431	395	498	377	383

The next group of diseases which demands particular notice is that known as "constitutional," and here the first disease which arrests our attention is cancer. The number of deaths is 334: a number which does not vary much in recent years, although, unhappily, there seems to be a steady tendency towards increase.

In all classes of tuberculous disease there is an increase in 1895, the total number of deaths being 1,664, as compared with 1,471 in 1894. This is eminently a preventable disease, and it is, thus, a matter for much regret that the diminution which has occurred in its fatality in recent years should be even temporarily arrested.

Under the heading of "developmental diseases" the chief difference is to be found under premature births, which number 330, against 232 in 1894. This number is also above the average of the years 1891--93.

Under "local diseases" we first encounter a gain of 35 from convulsions as compared with 1894. From valvular disease of the heart there is an excess of 38, and of 104 due to diseases of the circulatory system, generally not precisely specified.

From bronchitis and pneumonia the excess in 1895 over 1894 is 697.

From accidents there is an excess of 25.

From the group debility, atrophy, and inanition there is the large excess of 203 in 1895, to which we must add an excess of 74 dying from causes not ascertained, or ill-defined.

We have to account for an excess in the 1895 death-rate of 4·7 per 1,000 over that of 1894. 4·0 per 1,000 is made up as follows :—

Measles	0·54	Premature birth	0·19
Scarlet fever	0·11	Heart disease	0·21
Influenza	0·28	Bronchitis	0·63
Diarrhœa	0·96	Pneumonia	0·65
Tuberculosis	0·33	Other respiratory diseases	0·10

The greater part of the remaining 0·7 is made up by the excess from debility and ill-defined disease.

The steps which have been taken in respect of measles and diarrhœa will be discussed under their respective headings. As regards measles, no measures available appear effectual when it overtakes us in winter in a rapidly spreading outburst, and all that we can do is to mitigate the severity of the storm. Diarrhœa stands on quite a different footing. It is the consequence of a warm season, aided by such insanitary conditions as crowded and ill-ventilated dwellings, by filth in the soil, and above all by bad methods of feeding infants. For this disease the remedy is largely in our own hands. Tuberculosis, again, is a preventable disease, although, no doubt, the measures required to prevent it are sufficiently irksome, and, in the first instance, expensive.

With regard to respiratory disease, that is partly dependent on the atmosphere of certain parts of Manchester, and on the habits of the people ; but it is also largely dependent on the effluvia arising from insanitary conditions of the ground, and of the habitations in crowded localities. To that extent respiratory diseases are preventable. Heart disease is intimately correlated to disease of the lung, and the same remarks therefore apply, except that personal habits may have a more direct influence on affections of the heart than on those of the lungs.

Tables 2 and 3 in the Registrar-General's Annual Summary for 1895 enable us to compare our death-rates from the different zymotic diseases with those in other towns, and also to see how they stand as compared with the average, whether for Manchester or other towns, for the ten years 1885–94.

We thus see by Table 2 that the total zymotic rate is less than that of the following towns—Liverpool, Salford, Bolton, Burnley, Blackburn, Preston, and Wolverhampton. It exceeds, however, the rate in every one of the Yorkshire towns.

From measles the death-rate is higher than in the other towns, excepting Salford, Blackburn, and Bolton. It is also higher than the average for ten years.

The scarlet fever rate is exceeded only by those in Salford and Wolverhampton. It falls below the average for ten years. The diphtheria death-rate is 0·21 per 1,000; the average for the 33 towns 0·35. It is below the average for the ten years. The death-rate from whooping cough is below the average for ten years, and is also exceeded by the rate in a number of other towns.

The "fever" death-rate is also much below the average for the ten years, and is below the average for the 33 large towns.

From diarrhœa the death-rate is considerably above the average for ten years. It is, however, exceeded by the rates in Leicester, Nottingham, Liverpool, Bolton, Salford, Burnley, Blackburn, Preston, Bradford, Leeds, Sheffield, Hull, and Sunderland.

From what has been recorded above, it will be seen that the great improvement in the death-rates of 1894 was due to climatic causes, as stated in the Report for 1894, and cannot be taken as implying more than perhaps a slight permanent bettering.

Death-rates at different ages for the whole City.

Following the plan pursued in my first report, I now go on to examine the death-rates at groups of ages.

And, first, Table 2 of the Registrar-General's Annual Summary for 1895, and Tables E and K at the end of the Report, give us the means of estimating the infantile mortality.

From the Registrar-General's table we find that the deaths under one year amount to 203 per 1,000 births—a very high rate indeed; the average for ten years being 182. This increase is, however, general over the whole country, and, while the average death-rate is exceeded by only six towns, the exceptional mortality of 1895 is exceeded by eight, and is reached by two more. These towns are Liverpool, Bolton, Salford, Burnley, Blackburn, Preston, Wolverhampton, Hull, Leicester, and Bradford.

The diseases which have contributed to this high figure in Manchester are, first and chief, diarrhœa, then, *longo intervallo*, measles, and wasting diseases. From diarrhœa alone there is an excess of 19 deaths of infants per 1,000 born over the average of the years 1891–93, and of 21 per 1,000 over the rate for 1894. The excess over 1894 from wasting diseases is 13·89.

Doubtless this must be ascribed in some measure to diarrhœa, which is found to come in and stop short the vital course of so many weakly infants. It is, however, a discreditable and terrible testimony to the want of care for infant life that a rate of 54·89 per 1,000 born should occur in any year chiefly from malnutrition. The actual numbers are—from premature birth 330, debility, &c., 736.

Table K offers no grounds for satisfaction, except perhaps that the mortality from "convulsions" is exceptionally low in 1895. The mortality from whooping cough is, it is true, low, but the present year is making up for that.

From Table E we derive a clear conception of the dangers which beset infants from birth up to the end of their first year.

At the threshold, 330 perish by premature entrance into life.

In the first three months large numbers die from debility, and causes not clearly ascertained. Obscure conditions leading to convulsions also cut off many. Many die from affections of the lung and diarrhœa.

In the next three months the number of deaths from diarrhœa and from lung affections increases, and the number of deaths from tubercular diseases also increases. There are still many deaths from debility.

In the last six months the predominant cause of death is lung disease. A large number is still carried off by diarrhœa and debility, though the rate is a diminishing one. Whooping cough reaches its acme of destructiveness.

If we go on to subsequent years, we find that in the second year of life the largest cause of death is lung disease. Measles now exacts a heavy mortality, and attains its maximum. A large mortality is also exacted by diarrhœa and tuberculosis.

In the third year of life the principal causes of death in 1895 are lung disease and measles. Scarlet fever reaches its maximum.

In the fourth and fifth years a decided abatement has set in, except from diphtheria, which, however, in Manchester is not a very prevalent disease.

The estimated death-rate of the Registrar-General for the whole City exceeds that of the Health Office, which is 24·51. This arises through the Registrar-General reckoning among Manchester deaths the deaths of non-residents which took place in public institutions within the City; while, at the same time, the deaths of Manchester citizens dying in institutions outside the City are included, as far as possible. Clearly an excessive death-rate is thus furnished by the Registrar-General.

Taking our own estimate, the total mortality exceeds somewhat that of the average for the three years 1891–93. When, however, we compare the death-rates at different groups of ages, we see that in 1895 the average death-rate of those years is lower at all groups of ages except at the ages 0–5. It is, therefore, the high mortality in childhood which has so much raised the figure for last year.

This will be best seen on a statement of the figures :—

DEATH-RATES AT GROUPS OF AGES.

	Under 5 years	5 to 15	15 to 25
Average for 1891–93	83·18	4·65	5·31
1895	87·74	4·48	5·19

	25 to 45	45 to 65	65 and upwards
Average for 1891–93	12·87	37·32	124·70
1895	12·06	36·33	120·95

With the exception of the age group 25–45, on the other hand, the rates for 1895 are above the averages for the four years 1891–94.

When, now, we examine the figures for childhood—viz., at ages 0–5—we find that the high mortality in 1895 is entirely due to the three causes : measles, diarrhœa, and diseases of the lungs. The death-rate in 1891 is, it is true, higher from lung disease, but it is considerably lower from measles and from diarrhœa. That was the last year, it will be remembered, of excessive prevalence of influenza, which accounts for the excess of lung disease.

In 1893, again, the death-rate is slightly higher from diarrhœa, but it is somewhat lower from lung disease, and much lower from measles. In 1892 and 1894 the death-rates are lower than in 1895 from all three causes.

In respect of the other diseases mentioned in Table M, young children escaped comparatively lightly, with the exception of scarlet fever, from which the death-rate was the highest of the five years.

At the school age (5–15), the chief causes of death are scarlet fever and diphtheria, tubercular disease, disease of the brain, and diseases of the lungs. The death-rates from each of these causes, excepting diphtheria, is higher than in 1894. The mortality from typhoid fever is, however, greater at that age in all the years 1891–94. It is also somewhat higher in the years 1891–93 from scarlet fever and diphtheria. From tubercular disease there is but little difference, except that in 1894 it is decidedly the lowest. From disease of the brain, again, it is lower than in 1891–92, higher than in 1893–94. From diseases of the lung it is, however, decidedly the highest of the five years.

At the age of adolescence (15–25) the most marked cause of death is tubercular disease, considerably more than a third of all deaths at this period of life being due to this infectious and largely preventable disease. A retrogression has apparently occurred since 1894, the death-rate from this cause being 2·07, against 1·75 in 1894, 1·64 in 1893, 2·04 in 1892, and 1·96 in 1891.

Typhoid fever now comes into prominence, and the death-rate from this cause is, though higher than in 1892–94, much lower than in 1891. This is the age at which the highest death-rate from this cause is exacted in Manchester.

Disease of the heart now begins to be prominent, and from this cause the death-toll is the highest of the five years.

At this age, lung diseases other than phthisis touch their minimum. Corresponding to the increase of influenza in 1895, the number of deaths from this group has increased.

The mortality in early adult life (ages 25–45) is more than double that of adolescence. The stress and strain of life are beginning to tell. Excess, injurious occupations, care, and failure begin to weigh heavily on life. Tubercular disease still exacts the largest proportion of victims. Nearly a third continue to die from this cause.

There is but little variation in the death-rate from consumption from year to year. Such variation as occurs is from other sources.

Diseases of the lungs come next to tubercle, with a rate of 2·21 per 1,000. This is considerably above the rate for 1894, but is below those for 1891–93. Diseases of the heart have now begun to tell severely, the rate being 1·38 per 1,000, which is higher than that holding for 1892–94. From typhoid fever at this age the mortality is lower than in 1891–93, and about the same as in 1894.

In later adult life (45–65) the death-rate is not far from being three times as great as in the previous period. From tubercular disease it is a little less, and continues to fall with advancing years. It is still, however, 3·8 per 1,000, about the average for the five years. But deaths from this disease now number only about one-tenth of the total.

Diseases of the brain have taken a great leap; and apoplexy, with other degenerative brain changes, exacts a mortality of 4·21 per 1,000: a figure nearly the same as in 1894, and lower than in 1891–93.

Diseases of the heart have become very fatal, the death-rate being 5·64 per 1,000, which is much above the corresponding figure for 1894, but lower than the average of 1891–93.

Diseases of the lungs now exact considerably over one quarter of the total mortality, and in 1895 the rate from this cause is in excess of that in each of the previous three years; much in excess of that in 1894. Diseases of the digestive organs and of the urinary system have now begun to be more fatal.

Those who have reached the age of 65 succumb much more rapidly, the chief agents in their removal being diseases of the lungs, heart, and brain. Lung disease plays a much more conspicuous part in 1895 than in 1894. Tubercular disease still numbers a few victims, and diarrhœa carries off still more.

Not a few die from disease of the digestive organs and from urinary troubles, though these causes of death are decidedly less prominent in 1895 than in other recent years.

From old age and general decay, without any prominent symptom, many pass away, and the deaths so ascribed are more numerous than in the previous four years, with the exception of 1891.

The death-rates in Manchester at different periods of life as compared with those at the corresponding ages in other parts of the country are given in the following table, which shows that the excessive mortality in Manchester in childhood is followed by a drop at the school age, so that the rates are nearly equal. From the age of 15 upwards, however, the excess in Manchester again becomes pronounced.

TABLE 2.—ANNUAL RATES OF MORTALITY IN MANCHESTER IN THE YEAR 1895 AT TWELVE GROUPS OF AGES AMONGST PERSONS, MALES AND FEMALES, COMPARED WITH THE AVERAGE RATE AT THOSE AGES IN ENGLAND AND WALES DURING THE DECENNIUM 1881–90.

	PERSONS		MALES		FEMALES	
	Manchester, 1895	England and Wales, 1881–90	Manchester, 1895	England and Wales, 1881–90	Manchester, 1895	England and Wales, 1881–90
All Ages	24·51	19·17	26·41	20·28	22·74	18·06
0—	87·74	56·77	94·20	61·59	81·42	51·95
5—	5·90	5·31	5.07	5·35	6·71	5·27
10—	3·02	3·04	3·12	2·96	2·92	3·11
15—	4·44	4·38	4·80	4·33	4·09	4·42
20—	6·00	5·64	6·48	5·73	5·58	5·54
25—	8·79	7·20	8·93	7·78	8·66	7·41
35—	16·38	11·51	19·48	12·41	13·44	10·61
45—	27·74	17·23	31·23	19·36	24·62	15·09
55—	51·88	31·57	58·62	34·69	46·43	28·45
65—	95·48	65·38	113·67	70·39	82·99	60·36
75—	224·92	138·88	278·77	147·14	192·96	130·62
85	327·19	288·32	318·84	305·81	331·08	270·82

Comparison of different districts of the City.

We have seen that the birth-rate has undergone a reaction from the low point which it reached in 1894. This is manifested in each of the three divisions of the City, though in a greater degree in the Manchester Township than in the more outlying parts.

As regards the Manchester Township, it is interesting to observe that the birth-rate is persistently lower in the Central division than in Ancoats and St. George's. This must be taken to indicate a different distribution of the population.

In the same way, Crumpsall in North Manchester and Rusholme in South Manchester have persistently low birth-rates. In these two cases, indeed, the downward movement of the birth-rates continues in 1895.

It is a difficult matter, without knowing more accurately than we do the distribution and changes of population in different parts, to tell how much importance is to be attached to high birth-rates or to high death-rates, since manifestly an exceptional increase in any portion of the City would have the effect of raising both. Much uncertainty is hereby produced, which would be removed by the institution of a quinquennial census.

It is, however, in the Central part of the City—where the change, if any, of the population must be the reverse of this—that both birth-rates and death-rates are highest.

The highest birth-rate in each of the five years is in the Manchester Township, and the highest in that division is in Ancoats. The next highest for each year is in St. George's. In North Manchester the highest birth-rates are in the adjoining districts of Bradford and Beswick. In South Manchester the highest birth-rate is in West Gorton. The next highest rates, though at a considerable interval, are in Ardwick and Hulme, followed by that in Openshaw, as well in 1895 as on the average of five years, 1891–95.

Thus, if we except St. George's, that portion of Manchester which yields the highest proportion of new lives is a continuous area, containing Ancoats, Bradford, Beswick, Ardwick, West Gorton, and Openshaw.

Now, while the uncertainty as to changes in the population affects the death-rates and birth-rates of the districts, it affects them to the same extent, and the difference, therefore, is equally affected. This difference is the natural increase of the population, which only amounts to 4·7 per 1,000 in the Manchester Township. In Ancoats, it is true, it rises to 8·5 per 1,000; but in the Central district there is in 1895 an actual decrease of 2·3 per 1000, by the preponderance of deaths over births. The same reversal of the usual relation occurred in 1891 and 1892 in this district, and in this alone.

In 1895 the natural increase of the population was over 10 per 1,000 in the following districts in North Manchester: Cheetham, Harpurhey, Moston, Newton Heath, Bradford, Beswick, and Clayton.

In only two districts in the Southern division did the natural increase of the population reach this figure, namely, in West Gorton and Openshaw, which adjoin North Manchester.

There is thus a terrible squandering of human life in the Manchester Township, and, though to a less extent, in South Manchester.

If, now, we take the general death-rate of 203 deaths in children under 1 year to 1,000 born in 1895, we find that this rate is exceeded in Ancoats, Central, and St. George's; for North Manchester in Harpurhey, Bradford, and Clayton; and for South Manchester in Openshaw, West Gorton, and Hulme.

When we, further, examine the statistics given in Table K for the three principal divisions of Manchester, we find that the Manchester Township has the highest death-rates from whooping cough, the notified infectious diseases, diarrhœa, convulsions, and "found dead in bed." South Manchester has, however, a higher death-rate from tubercular disease, measles, and wasting disease.

In 1894 there was the same preponderance of the infantile death-rate in the Manchester Township, which lay, however, in deaths from lung disease, wasting diseases, diarrhœa, and convulsions.

From every cause except the comparatively light ones of notifiable infectious disease and whooping cough, and from the causes known as convulsions, other nervous diseases, and lung diseases, North Manchester has a much smaller death-rate than South Manchester; moreover, the preponderance from the causes mentioned is small. From every cause, with the exception of lung diseases, the death-rate is smaller than in the Central division.

The difference in the total death-rates in the several divisions is, as usual, very great. In the Central division the proportion of deaths to 1,000 of the population is 31·59, in South Manchester 23·02, in North Manchester 19·53.

In 1894 the corresponding rates were 25·27, 18·89, and 15·52.

Many of the particulars of which the excess of the Central division is made up are to be found in Table L. The principal causes are phthisis, bronchitis, pneumonia, heart disease, nervous diseases, and diarrhœa. But, of all the causes enumerated in that table, in two only was the death-rate lower than in South Manchester by as much as 1 in 10,000, viz., in measles and consumption of the bowel.

In nearly every group of that list the death-rate in the Central division exceeds that in North Manchester, and generally by a considerable amount. In regard of one disease only—viz., diphtheria—is it as much as 1 in 10,000 lower in the Central division than in North Manchester.

The comparison between the outlying divisions is, perhaps, of more interest from a sanitary point of view. Here there is a difference of 3·5 per 1,000 in favour of North Manchester. It will be remembered that North Manchester stands higher, is more bracing in its climate generally than the South division, and that the latter is considerably the more densely populated of the two.

The causes in which the preponderance is manifested in the South Manchester death-rates are tubercular disease, measles, premature birth, cancer, lung disease, scarlet fever, diarrhœa, and heart disease.

Now a greater crowding of population would tend to produce excess of measles and scarlet fever. If actual overcrowding prevailed in addition, as it does in certain parts of the division, South Manchester might be expected to sustain the greater incidence of phthisis, which it does. The same cause would lead to a greater prevalence of lung disease, and hence also of heart disease. Diarrhœa, given other insanitary conditions, or even under like conditions otherwise, might be expected to be more fatal. There remain premature births and cancer.

With regard to cancer, the same preponderance holds throughout the five years 1891–95. For that I can offer no explanation.

It is the same with premature births, excepting in 1893; and though a plausible explanation might be suggested for this, to ascertain the real reasons would be a work of great difficulty.

Per contra, North Manchester has a higher death-rate from "diphtheria," and, though the difference is very slight, from puerperal fever also. From diphtheria this excess is present in each of the five years 1891–95. It is the same with regard to puerperal fever, excepting in 1891, when the rates were equal, and in 1893.

When, now, we compare the mortalities at groups of ages, we find, as in 1894, that there is an excess in the Central division at each period of life, which falls, as in 1894, especially on the adult period (25 to 65). Indeed, in 1895 the death-rate is considerably more than double what it is in North Manchester at the ages 25 to 45, and is little short of double at the age period 45–65. This is partly due to the number of tramps, &c., who simply pass through the Central division to the workhouse to die; but it is also largely due to the habits and conditions of life in that part of the City.

In early childhood (age 0–5) the marked excess in the Township lies in diarrhœa, diseases of the brain (which include convulsions), diseases of the lungs and other diseases (including debility), and whooping cough.

At school ages (5–15) the excess lies in tubercular disease and diseases of the lungs, to a less extent in diseases of the brain.

At adolescence (15–25) the principal causes are tubercular disease, disease of the heart, and diseases of the lungs. The causes not enumerated also give a large excess.

In early adult life (25–45) the great excess which exists is most conspicuous in tubercular disease, diseases of the lungs, diseases of the heart, diseases of the urinary system, and in the causes not specified.

In later adult life the chief preponderance of fatality in the Central division lies in lung diseases and tuberculosis, along with heart disease. Diseases of the brain now become prominent, and diarrhœa also accounts for part of the difference.

In old age (over 65) the excess lies almost entirely in diseases of the lung and heart, and amongst the causes not enumerated.

This is very much the same story as had to be told in 1894, and the comments remain much the same. It is a preponderance made up of insanitary conditions, bad habits, and poverty.

As we have seen, the death-rate in South Manchester considerably exceeds that in North Manchester.

In early childhood the difference is also marked.

At this age the greatest excess in South Manchester is from measles, diarrhœa, and tubercular disease, and from causes not enumerated. Comparatively small excesses occur from scarlet fever and whooping cough.

On the other hand, the mortality is lower from diphtheria, diseases of the brain, and diseases of the digestive system.

At ages 5–15 the death-rate is slightly lower in South than in North Manchester, notably so from diphtheria, from diseases of the lung, diseases of the brain, including convulsions (which is frequently of digestive origin), and diseases of the digestive system. It is, however, higher from scarlet fever and from tubercular disease.

At ages 15–25 the death-rate in South Manchester is somewhat the higher. It is especially so in respect of tubercular disease.

At ages 25–45 it is much the higher in the Southern division, especially so, again, from tubercular disease, and, also, from typhoid fever.

At ages 45–65 the death-rate in South Manchester is again in advance, chiefly in tubercular disease, in diseases of the lungs and heart, and from the causes not specified.

Over 65 years there is also a difference, though not a great one, against the Southern division, which now lies chiefly in diseases of the urinary system, diseases of the lungs, diseases of the brain, and tubercular disease.

Comparison of different districts.

When, now, we consider the statistics of the different constituent districts of the City, we encounter some interesting facts.

If we examine Table J, we perceive that in each of the five years 1891–95, the percentage of illegitimate births is much in excess in the Central district of the Manchester Township, in the Crumpsall district of North Manchester (with the exception of 1893), and in the Chorlton district of South Manchester.

In each of the three districts named, there are special explanations of this excessive illegitimacy. In Chorlton, the number of illegitimate births is artificially raised by the presence in that district of a maternity home.

It has to be observed that the fatality is not greatest in those districts in which the percentage of illegitimacy is highest. Thus the illegitimate children born in the Central district died at the rate of 365 per 1,000 born, in Crumpsall at the rate of 263 per 1,000, in Chorlton at the rate of 272 per 1,000.

The rates for the whole divisions were 415 per 1,000 in the Manchester Township, 425 in North Manchester, and 375 in South Manchester.

Indeed, the heaviest death-rates in illegitimate infants were in those districts in which the rate of illegitimacy was lowest of all, viz. : in Cheetham, 778 per 1,000; in Harpurhey, 1,000 per 1,000; and in Bradford, 813 per 1,000.

Next comes Hulme, with a mortality rate of 521 per 1,000, and an illegitimate rate considerably above the average for the City. It would almost seem, therefore, as if least care were bestowed on illegitimate infants where they might least be expected to be born.

On reference to Table 2 of the Registrar-General's Annual Summary for 1895, it will be seen that the figure giving the percentage of deaths, the causes of which have not been certified, is lower than that of a number of other towns; it is still most unsatisfactory, and it is difficult to see why so many uncertified deaths should be accepted for the Manchester Township as we have year by year. It is, to say the least, not less necessary to exercise stringency in ascertaining the causes of death in Ancoats than it is in other parts of the City. The same remark applies for other years to the other divisions of the Manchester Township, and to some districts in South Manchester.

If we take the general death-rates as given in Table H, we find that the death-rate in each district of the Manchester Township exceeds 30 per 1,000. The 1895 death-rate for this Township exceeds that in every year since 1891. Corresponding to the infant mortality of 241 per 1,000 infants born, a figure considerably above that for every other district, it is highest in the Central district.

Looking next at the figures for North Manchester, we see that the death-rate is 24·19 in Bradford; Newton Heath and Beswick coming next with 20·37 and 20·35 respectively. This is no fortuitous occurrence. If we take the districts with populations exceeding 10,000, we find that the order of mortality is in successive years:—

1891.—Bradford, Beswick, Newton Heath. In this year Blackley came third.

1892.—Beswick, Newton Heath, Bradford.

1893.—Bradford, Beswick, Newton Heath. In this year Clayton had the highest mortality rate, then Bradford, then Blackley, then Beswick, then Harpurhey, and then Newton Heath.

1894.—Bradford, Newton Heath, Beswick. Blackley and Clayton had, however, higher death-rates than Beswick.

1895.—Bradford, Newton Heath, Beswick.

Clearly, then, Bradford is decidedly the most insanitary of all the districts in North Manchester. I had occasion last year to comment on the terrible state of the privy accommodation as reported by the inspector of this district.

The comparatively high death-rate in Bradford is the more worthy of note, inasmuch as the density of population is so much greater in Beswick. For the same reason, Newton Heath must be regarded as being under worse sanitary conditions than Beswick.

Examining the statistics for South Manchester in the same manner, we find, taking the three highest death-rates for each year, that they run as follows:—

1891.—Hulme, Ardwick, West Gorton.

1892.—Hulme, Chorlton-upon-Medlock, Ardwick, and West Gorton.

1893.—Hulme, West Gorton, Openshaw.

1894.—Hulme, West Gorton, Chorlton-upon-Medlock.

1895.—Hulme, West Gorton, Ardwick.

The death-rate is always higher in Hulme than in the other districts. That is to be expected if we have regard to the comparative density of the population, the manner in which the houses are crowded together, the overcrowding which exists in the houses, and the saturated state of the ground over considerable areas. It is, however, far in excess, even with the existing density of population, of what it ought to be, and what it might be.

As regards West Gorton, considering its situation and its relative density of population, there is every reason why the death-rate should be under 20 per 1,000. A chief cause of the mortality in this district is to be found in the midden privy system, and in the manner in which this system has been arranged.

In estimating the condition of the districts, so far as represented by death-rates, it is necessary, for an accurate conception of what they mean, to make a correction for the variation in the numbers living at different ages. The death-rates so corrected are exhibited in the following table, from which it will be seen that this correction has the effect of considerably raising the death-rates in all the districts.

TABLE 3.—YEAR 1895.—RECORDED AND CORRECTED DEATH-RATES PER 1,000 PERSONS LIVING.

Groups of Civil Parishes in the Sub-Districts of Manchester, arranged in order of their corrected Death-rates	* Standard Death-rate	† Factor for correction for Sex and Age Distribution	Recorded Death-rate, 1895	‡ Corrected Death-rate, 1895	§ Comparative Mortality Figure
Cheetham and Crumpsall	17·91	1·0693	16·33	17·47	912
Moston	17·72	1·0807	17·70	19·13	999
Clayton	17·71	1·0815	18·37	19·87	1,038
Blackley and Harpurhey	17·16	1·1157	19·48	21·73	1,135
Newton Heath, Bradford, Beswick, and Kirkmanshulme	17·08	1·1211	21·15	23·71	1,238
Chorlton-upon-Medlock	16·29	1·1755	21·32	25·06	1,309
Ardwick, Openshaw, West Gorton, and Rusholme	16·81	1·1374	22·36	25·44	1,328
Hulme	16·93	1·1309	25·96	29·36	1,533
St. George's	16·89	1·1340	31·00	35·16	1,836
Ancoats	16·83	1·1381	31·10	35·39	1,848
Central	16·25	1·1782	33·23	39·15	2,044
England and Wales	19·15	1·0000	18·71	18·71	1,000

* The standard death-rate signifies the death-rate at all ages calculated on the hypothesis that the rates at each of twelve age periods in each town were the same as in England and Wales during the ten years 1881-90, the death-rate at all ages in England and Wales during that period having been 19·15 per 1,000.

† The factor for correction $\left\{=\frac{19\cdot15}{\text{Standard death-rate}}\right\}$ is the figure by which the recorded death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The corrected death-rate is the recorded death-rate multiplied by the factor for correction.

§ The comparative mortality figure represents the corrected death-rate in each town compared with the recorded death-rate at all ages in England and Wales in 1895 taken as 1,000.

TABLE 4.—DEATH RATES* IN THE HOMES OF THE PEOPLE, IN WORKHOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY.

STATISTICAL DIVISIONS	Estimated Populations	Death-rate per 1,000 of persons dying in their own homes	Death-rate per 1,000 of persons dying in Workhouses	Death-rate per 1,000 of persons dying in Hospitals	Total death-rate per 1,000
City of Manchester ...	‡ 527,010	19·79	3·05	1·67	24·51
I. Manchester Township	146,674	22·33	6·72	2·54	31·59
II. Northern Districts ...	136,166	17·65	0·68	1·20	19·53
III. Southern Districts ...	244,170	19·47	2·15	1·40	23·02
(TOWNSHIPS)					
I. Ancoats	46,242	23·59	4·87	2·64	31·10
Central	36,957	21·38	9·17	2·68	33·23
St. George's	63,475	21·97	6·65	2·38	31·00
II. Cheetham	30,310	14·85	0·83	1·15	16·83
Crumpsall	8,873	13·75	0·56	0·34	14·65
Blackley	7,753	17·54	0·65	1·03	19·22
Harpurhey	10,679	18·17	0·65	0·84	19·66
Moston	6,102	17·04	...	0·66	17·70
Newton Heath	36,138	18·15	0·75	1·47	20·37
Bradford	22,030	22·01	0·82	1·36	24·19
Beswick	10,417	18·24	0·38	2·73	20·35
Clayton	3,864	17·08	0·26	1·03	18·37
III. Ardwick	36,779	20·85	1·99	1·58	24·42
Openshaw	28,603	18·53	0·98	1·36	20·87
West Gorton	26,793	20·94	2·09	1·42	24·45
Rusholme and Kirk.	18,832	14·02	1·01	0·79	15·82
Chorlton-on-Medlock	61,023	17·26	2·75	1·31	21·32
Hulme	72,140	21·89	2·51	1·56	25·96

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* In this table, *every death* occurring in a Public Institution has been referred to the Township from which the patient originally came.

‡ Population estimated to middle of 1895.

TABLE 5.—POPULATIONS—DEATHS OF MANCHESTER RESIDENTS, 1895, IN PUBLIC INSTITUTIONS.

Township	NAME OF INSTITUTION	Population, 1891	Deaths, 1895
ANCOATS	Ancoats Hospital	64	97
CENTRAL	Workhouse Casual Wards	167	6
	Royal Infirmary	260	298
	St. Mary's Hospital	27	11
	Lock Hospital	25	...
	Eye and Ear Hospital	7	2
	Alsop's Boys' Home	11	...
	St. Joseph's Girls' Home	17	...
	Chetham Hospital	100	...
	Mission Refuge (St. John's Parade)	8	...
	Consumption Hospital	...	1
ST. GEORGE'S	Girls' Home (Charter Street)	21	...
CHEETHAM	Her Majesty's Prison	922	8
	Boys' Refuge	185	...
	Girls' Friendly Society	18	..
	Clinical Hospital	36	68
CRUMPSALL	Manchester Workhouse	2,608	982
*	Prestwich Workhouse	305	94
BLACKLEY	Manchester and Salford Reformatory	76	...
	Litchford Hall	152	4
	Well's House Convalescent Home	10	...
MOSTON	St. Joseph's Home	34	1
	St. Bridget's Orphanage	32	...
NEWTON	Monsall Hospital	185	200
	Little Sisters of the Poor (Culcheth Hall)	107	10
CLAYTON	Clayton Smallpox Hospital		3
ARDWICK	Industrial School	203	...
	Nicholls Hospital	100	...
RUSHOLME	St. Joseph's Girls' School	150	1
	St. Mary's Home	28	...
CHORLTON-ON-MEDLOCK	St. Joseph's Boys' School	413	...
	Royal Eye Hospital	59	1
	Little Sisters of the Poor (Plymouth Grove)	182	20
	Casual Wards (All Saints)	21	1
	Southern Hospital	23	26
	Cancer Hospital	19	12
	Maternity Home	11	8
	Home for Young Girls	18	...
	Rylands' Orphanage	17	...
	Church Army Labour Home	20	...
	Penitentiary	51	...
HULME	Cavalry Barracks	404	2
	Boys' Home (Chester Road)	20	...
	Loretto Convent	...	1
* OUTSIDE CITY.	Withington Workhouse	1,375	519
	Ashton-under-Lyne Workhouse	...	...
	Pendlebury Hospital	50	51
	Prestwich Lunatic Asylum	755	55
TOTALS		9,296	2,482

* Proportion only.

It has been already mentioned that much of the death-rate in the Manchester Township is due to poor people, who halt there on their way to the Union to die. How much of the death-rate in the Union is due to this cause, and how much to poverty arising in any district, it is impossible to say. We can, however, tell how much of the distributed death-rate in any district is due to poverty, and what proportion die in public institutions. Incidentally, much light is thrown by this knowledge on the sanitary state of the districts. I have, therefore, had calculated for each district the death-rates occurring in the union, in hospitals, and at home. We can thus tell by a glance at Table 4 what is the amount of poverty in the different parts of the City, so far as revealed by the poor death-rates.

In reference to these figures, it may be observed that an error in the estimate of the populations does not alter the proportion that the death-rate from poverty bears in a given district to the total death-rate.

This proportion we see to be very much larger in the Central districts than in South Manchester, and to be larger in each division of South Manchester than in any part of North Manchester.

We perceive further that the death-rates of people in their own homes are, after Ancoats, highest in Bradford, which we were prepared to find.

This figure is a useful sanitary index. The districts selected by it as being in an excessively bad sanitary state are Ancoats, Central, and St. George's in the Manchester Township; Bradford in North Manchester; Hulme, West Gorton, and Ardwick in South Manchester.

The institutions in which the deaths occurred, and the number of deaths, are given in Table 5.

INFECTIOUS DISEASES.

The diseases included in the Manchester Notification Act of 1881 are as follows: Smallpox, Scarlet Fever, Diphtheria, Typhus Fever, Enteric or Typhoid Fever, Relapsing Fever, Puerperal Fever, and Asiatic Cholera. Membranous Croup was added in 1892. The following cases were notified in 1895 and four previous years:—

	1891	1892	1893	1894	1895
Smallpox	2	118	607	282	51
Scarlet Fever	1,138	1,671	2,031	2,230	2,302
Diphtheria Membranous Croup	456	497	622	512	402
Typhus Fever	16	6	1	...	...
Enteric Fever	761	610	618	460	493
Relapsing Fever	4	...	...	...	...
Puerperal Fever	55	92	93	51	33
	2,432	2,994	3,972	3,535	3,281

SCARLET FEVER.

The distribution of this disease, and the extent to which Monsall is used for isolation, are shown in the first of the following tables. The percentage of cases removed to the Hospital has again risen, and now stands at the high figure of 71·3 per cent. The largest proportion of cases is removed from the Central parts, which is as it ought to be. It will be seen that the districts in which the disease assumed its most fatal aspects in 1895 are the three Central districts, and West Gorton, Bradford, and Crumpsall.

Examination of the statistics for previous years does not lead us to conclude that there is any fixed influence of district, except that in the Central portions of the City the children undergo a higher fatality in proportion to the number of attacks than they do elsewhere. On the other hand, the number of children attacked with scarlet fever in that part of Manchester is not comparatively high.

The disease was most prevalent in Ardwick, Beswick, and Cheetham It was also specially prevalent in Hulme, Crumpsall, Clayton, and Moston. The mortality from scarlet fever was, as in 1894, higher in South than in North Manchester, thus continuing the reversal of their relations in 1891-93 which was noted for 1894.

Scarlet Fever Attacks, 1895.

Townships of Manchester	Attacks	Attack Rate per 1,000 living	† Case Fatality, per cent.	Removals to Hospital, per cent.
Ancoats	166	3·59	9·0	80·1
Central	148	4·00	12·2	88·5
St. George's	307	4·84	8·1	79·8
Cheetham	160	5·28	3·1	70·0
Crumpsall	42	4·73	9·5	69·0
Blackley	13	1·68	...	61·6
Harpurhey	34	3·18	2·9	67·6
Moston	27	4·42	3·7	44·4
Newton Heath	127	3·51	6·3	65·4
Bradford	90	4·09	11·1	71·1
Beswick	66	6·34	4·5	75·8
Clayton	18	4·66	...	55·5
Ardwick	261	7·10	7·7	71·3
Openshaw	89	3·11	5·6	49·4
Gorton (West)	129	4·81	13·2	75·2
Rusholme and Kirk...	56	2·97	5·4	35·7
Chorlton-on-Medlock..	227	3·72	7·5	62·1
Hulme	342	4·74	7·0	74·0
City of Manchester.	**2,302**	**4·37**	**7·7**	**71·3**

† Corrected : the fatal cases are those actually occurring amongst the cases notified.

A second table exhibits the number of attacks at different ages, and the percentage of fatal cases at each age :—

Scarlet Fever, 1895.

Ages	Attacks	Deaths	Case Fatality*
Under one year...	36	14	38·9
1 to 2 years ...	93	24	25·8
2 to 3 „ ...	231	38	16·5
3 to 4 „ ...	266	35	13·2
4 to 5 „ ...	278	20	7·2
5 to 6 „ ...	243	11	4·5
6 to 7 „ ...	216	12	5·6
7 to 8 „ ...	193	6	3·1
8 to 9 „ ...	143	5	3·5
9 to 10 „ ...	106	2	1·9
10 to 15 „ ...	312	6	1·9
15 to 20 „ ...	94	...	...
20 to 25 „ ...	40	1	2·5
25 to 35 „ ...	37	2	5·4
35 to 45 „ ...	9	...	...
Over 45 „ ...	5	...	...
All ages............	2,302	176	7·7

* The figures in this column are the actual proportions of fatal cases to the attacks at those ages.

Percentage of Deaths in cases of Scarlet Fever at Different Ages.

Scarlet Fever, 1891, 1892, 1893, 1894, and 1895.

Ages	Attacks	Deaths	Case Fatality
Under one year...	147	34	23·1
1 to 2 years ...	422	82	19·4
2 to 3 „ ...	785	119	15·2
3 to 4 „ ...	1,006	132	13·1
4 to 5 „ ...	1,012	88	8·7
5 to 6 „ ...	992	65	6·6
6 to 7 „ ...	867	43	5·0
7 to 8 „ ...	781	32	4·1
8 to 9 „ ...	616	15	2·4
9 to 10 „ ...	495	12	2·4
10 to 15 „ ...	1,388	29	2·1
15 to 20 „ ...	445	6	1·3
20 to 25 „ ...	188	6	3·2
25 to 35 „ ...	164	2	1·2
35 to 45 „ ...	44	3	6·8
Over 45 „ ...	20	...	...
All ages............	9,372	668	7·1

The general course of the disease is exhibited in the following figures, showing the numbers notified week by week :—

SCARLET FEVER. ATTACKS IN WEEKS ACCORDING TO DATE OF RASH.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 5	33	April 6	27	July 6	48	Oct. 5	60
,, 12	23	,, 13	30	,, 13	51	,, 12	60
,, 19	35	,, 20	32	,, 20	47	,, 19	62
,, 26	35	,, 27	22	,, 27	46	,, 26	73
Feb. 2	33	May 4	18	Aug. 3	42	Nov. 2	65
,, 9	35	,, 11	27	,, 10	61	,, 9	67
,, 16	46	,, 18	42	,, 17	60	,, 16	59
,, 23	36	,, 25	43	,, 24	35	,, 23	58
Mch. 2	22	June 1	16	,, 31	45	,, 30	56
,, 9	23	,, 8	37	Sept. 7	63	Dec. 7	53
,, 16	26	,, 15	31	,, 14	58	,, 14	56
,, 23	31	,, 22	36	,, 21	78	,, 21	42
,, 30	33	,, 29	55	,, 28	84	,, 28	46
Total...	411	Total...	416	Total...	718	Total...	757

City Total, 2,302.

These illustrate the usual decline in the early part of the year, and the increase which occurs in the autumn. The uniformity with which this takes place is most striking, and the curve of attacks notified follows very nearly that of typhoid fever.

The proportion of deaths to cases attacked, at different ages, is shown in the second of the above-mentioned tables, which serves to remind us that this proportion diminishes rapidly as the child gets older. He has, therefore, a better chance of coming through the disease with his life, the longer we can keep him from taking it. Now the proportion of attacks to all children living is far the smallest during the first year of life, and is smaller in the second year of life than in subsequent years. Children over two years of age are, in fact, usually the first members of the family who suffer, and, if they are removed early enough there is a good chance of the infants escaping. Isolation in hospital is, from this point of view, a saving of infant life.

The chief reason, however, for removing cases to hospital is that children treated at home are, in a large proportion of instances, a source of danger to others.

The amount of scarlet fever in Manchester in 1895, and its fatality as compared with other towns, is shown by the following figures. It will be seen that the excessive prevalence of the disease recorded for 1894 continues in 1895.

SCARLET FEVER ATTACKS.—RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
Twelve Notification Towns*...	4·77	2·95	4·55	5·19	4·23	4·34	3·40
City of Manchester	5·26	2·24	3·25	3·92	4·27	3·79	4·37
Manchester Township	5·33	1·92	3·63	2·45	3·77	3·42	4·23
North Manchester	4·95	2·32	4·64	5·14	5·02	4·41	4·24
South Manchester	5·31	2·39	4·28	4·16	4·16	4·06	4·52

* These are Blackburn, Bolton, Bradford, Halifax, Huddersfield, Hull, Liverpool, Oldham, Preston, Salford, Sheffield, and Warrington.

SCARLET FEVER MORTALITY.—RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
England and Wales............	0·24	0·17	0·19	0·24	0·17	0·20	0·15
33 Great Towns	0·33	0·18	0·25	0·29	0·21	0·25	0·18
London........................	0·21	0·14	0·27	0·37	0·22	0·24	0·19
Manchester City...........	0·60	0·22	0·27	0·27	0·22	0·32	0·33
Manchester Township	...	0·22	0·35	0·23	0·26	0·27	0·37
North Manchester	...	0·22	0·39	0·39	0·18	0·30	0·24
South Manchester	...	0·23	0·16	0·23	0·22	0·21	0·35
50 Smaller Towns	0·30	0·22	...	...	...	0·26	...
67 Smaller Towns	...	...	0·20	0·20	0·16	0·19	0·16
Rural Districts..................	0·18	0·15	0·15	0·20	0·14	0·16	0·12

A comparison of the figures giving the incidence of the disease in the respective districts in successive years shows that it moves from one district to another comparatively slowly. If a number of curves be made, indicating the movement of scarlet fever in the different districts, we find that though there is a general upward movement in 1894, this is not invariable, and considerable differences exist as to the continuance of the movement even in adjoining districts. Thus, the movement is upward in Newton Heath and Harpurhey in 1894, downward in 1895. In Moston it is down in 1894, up in 1895. In the Central, St. George's, and Crumpsall districts the movement in 1895 is upward. There is, in fact, not that swift transmission of infection which occurs in measles. To some extent this is due, no doubt, to preventive measures. But, besides, under ordinary circumstances there is a smaller intensity of infectiveness with scarlet fever than with measles. This feature of scarlet fever is also suggested by the longer intervals between extensive prevalences of the disease.

It is during the lesser prevalences of these diseases that we may profitably expend most time in tracing out the history of cases, and tracking the ways by which it extends. With sufficient care and attention it becomes possible for a sanitary inspector to become comparatively expert in preventive methods.

In the course of last year it became evident to me that the manner in which inquiries were made by the inspectors on visiting cases of fever was susceptible of considerable improvement, not so much in form as in the care exercised in ascertaining the facts. Dr. Tonkin visited a number of houses, and sent me independent reports, which satisfied me that my impression was a correct one. By an examination of every report sent in, by annotations, and by following the action taken at each house consequent on the occurrence of fever, I have been able to get much better work. The improvement, generally, is very great. The inspectors have been furnished with memoranda to guide their inquiries, and in the course of a year or two it is to be hoped they will improve generally as inquirers, so far, that is, as the limited scope of these investigations goes. It is difficult, however, to maintain that supervision over the work, or to institute new inquiries, without some assistance.

The connection between Scarlet Fever and fouling of the ground.

When a chart is drawn of the number of cases of scarlet fever reported week by week, the curve is seen to have an annual rise and fall, the apex coming in early autumn, and being nearly coincident with the apex of the curve for typhoid fever. Scarlet fever would thus seem to be subject to influences of the same nature as typhoid fever. Similar phenomena may own, of course, widely different causes. But the suggestion which the mind first receives, it may be only slightly, is that the conditions which cause the annual waves of diarrhœa, of enteric fever, and of scarlet fever are of the same order.

That, however, is not the manner in which the subject presented itself to me. Having found it necessary to examine carefully the reports sent in by the sanitary inspectors in connection with the cases of disease notified, I was struck by the intimate association between scarlet fever and defective conditions of the privies—much more intimate, indeed, than appeared to be the case last year for diarrhœa. It is necessary to use the words "appeared to be the case," since greater care has been recently used in recording the conditions of the closets. But the association is more intimate even than that existing in the case of enteric fever. We are thus thrown on one of two suppositions, either that the soil of the City is in an intolerable state of pollution, or that there is really a causal connection between fouling of the soil and prevalence of scarlet fever.

The particulars which I have collected relate to considerably over 1,000 cases of the disease and to nearly 1,000 privies, and may be conveniently summarised in the following table, which gives the figures for three successive periods, from the beginning of December, 1895, to the end of April, 1896 :—

Nature of the Closet			Distance of Pail from House		
Midden	Pail	W.C. or W.W.C.	Adjoins	Within 4 feet	4 feet and over
55	210	26	113	15	82
53	224	24	109	10	105
65	267	32	147	9	111
173	701	82	371	34	298

Urine Guide off or Corroded		Pail floor wet in additional instances		Midden		
Adjoins	Does not adjoin	Adjoins	Does not adjoin	Adjoins	Within 6 feet	6 feet and over
45	28	31	21	14	10	31
51	40	16	18	12	16	25
69	36	28	34	8	15	42
165	104	75	73	34	41	98

It is perhaps necessary again to explain that the urine guide is a strip of metal fastened round the rim of the closet seat to guide the urine into the pail when the closet is used, and that when this guide is absent the urine passes between the pail and its confining walls on to the closet floor and thence into the ground, by which it is carried into the foundations of the dwelling. Nor is this the only way in which the ground is polluted, since in many instances, owing to previous soakages, the ground has sunk and become irregular, or there is an accumulation of materials where the pail is placed, so that when it is replaced it is not planted below the seat. In many of the cases here briefly stated the ground is simply a cesspool. To this may be added that many people are said to be in the habit of throwing slops into the receptacle for ashes—that is to say, on the closet floor. More commonly, however, the wet and frequently sunk condition of the floor is due to urine.

What, then, are the facts as regards scarlet fever. In all, the condition of 701 pails is recorded. Of these, 371 or over one-half adjoin houses, generally lying against the scullery, where food is kept. Of these, again, 165 are without an adequate guide, which generally means its entire absence, and in 75 more the floor is found to be wet, and often sunk. That is to say, in nearly two-thirds of the instances in which the pail closet is against houses the ground is fouled, and the foundations of the houses are soaked with liquid filth.

Of the total 701 pails 427, or 3 out of every 5, are in such a condition that the ground around them is polluted.

Is it not abundantly manifest that these conditions are certain to produce a large amount of fatal disease, even if their connection with scarlet fever were not clearly indicated?

An arrangement was made between the Sanitary Committee and the Cleansing Committee in 1894 that the defective urine guides should be replaced, and that the Sanitary Committee should defray the expense. This arrangement has been, as yet, only partially carried out, although over 17,000 guides have been fixed.

These figures are striking when placed side by side with those relating to diarrhœa, and seem to show a higher degree of pollution of the ground in scarlet fever. Out of 500 deaths from diarrhœa, in 422 the condition of the privy was noted. Amongst these 176 pails were used not observed to be defective, though in many of these I have no doubt that the ground was wet with urine. In 60 more no defect was noted, though the closet was against the house wall. In 44 the pail closet was defective, and the ground was consequently soaked, though the closet was not against the wall of the house. In 42 the pail closet was against the wall of the house and defective, so that the ground and walls were both soaked with foul liquid. In all there were 322 pail closets, of which 86 were noted to be defective—over one-quarter, that is, were in such a state that the ground was fouled. Of deaths in houses provided with middens there were 93, of which 20, or over one-fifth, were against the walls of houses. Of water-closets there were altogether 33. When I add that the middens are not in any way constructed so as to prevent soakage into the soil, and that there are only about six times as many pails as middens, the mere statement is sufficient to show how disastrous such a condition of things is and must be.

Is there any special reason in the nature of scarlet fever why we should be disposed to think that the frequency of defective privies in scarlet fever is not accidental? In my opinion there is. It is well known to pathologists that in severe fatal cases of scarlet fever there is considerable disease of that portion of the bowel and of the associated glands which are chiefly affected in typhoid fever. Further, in a certain proportion of the severe cases, there is acute diarrhœa. Then, again, the affections of the kidney which take place at both the early and later stages of the disease suggest an elimination of the infective matter of the disease by that channel. Supposing, therefore, the infective matter of scarlet fever capable of life outside the body, the conditions above recorded are precisely those required to lead to its harbourage and propagation.

The power which scarlet fever possesses of propagating itself by direct infection should be no barrier to our weighing carefully its potency of carriage by other channels, since the same power of direct infection is possessed by such diseases as typhoid fever, erysipelas, and puerperal fever. This power, however, being so much greater in the case of scarlet fever, is liable to hinder us from directing our attention to such possibilities as I now suggest.

It might be supposed at first glance that the suggestion here made as to the means provided by defective privies for the continuance of scarlet fever might be checked and controlled by a comparison of one district with another or of one town with another, and that those districts and towns in which defective privies were most known to prevail ought to give the highest rates from scarlet fever. Possibly something might be gathered from that source. But it must be pointed out that these considerations glance at urine as well as at solid excreta, and that consequently we cannot look to the midden system as necessarily showing a worse result than the pails. Further, the factor of direct infection at school, at home, and at play, which is itself a variable one, introduces an element of great complexity.

On return cases of Scarlet Fever.

Another point of great importance in connection with scarlet fever is the occurrence of fresh cases in a household subsequent to the discharge of cases which have recovered in hospital. In Manchester the patients are kept for a long time in hospital, and are very rigorously disinfected, as disinfection has been hitherto understood. Still, a certain proportion of cases continues to occur.

It is true this does not much diminish the value of the hospital in removing infective material from the community. But it unquestionably lessens its usefulness to the household from which the case has been removed.

was, therefore, with much pleasure that I read the careful and well-weighed paper by Dr. T. W. Thompson, Inspector of the Local Government Board, in the *Lancet*.

Reflection on that paper, and examination of the Manchester records, inclined me to think that more precision of opinion was possible, and that it was possible, perhaps, to arrive at a sufficient clearness of view to formulate a definite course of action. It appeared to me that the subsequent history of cases retained at home did not point to the cases so kept as a powerful factor in this distal infection, and that the infection was due to something brought from the hospital. It was suggested to me, by one who has had intimate practical knowledge of the disease, that the infection was lodged somewhere about the cavities of the face. When we consider the matter we cannot fail to see the likelihood of this occurrence. A child treated in hospital breathes through the nostrils a large amount of infected air, and the infective matter must be largely intercepted in the nasal tract.

On coming to this conclusion, I lost no time in explaining this view to Dr. Marsden, at Monsall Hospital, and urging that the children, before discharge, should be isolated in the wooden pavilions (until 1894 used for the treatment of smallpox), and should there be prepared for discharge.

It is not to be supposed, however, that this view of the occurrence of return cases is meant to exclude the possibility of the same thing happening after a child is discharged from quarantine at home. There is still a possibility that the child will in this manner store up its own infection, and part with it afterwards. Manifestly, however, there is not so much danger of this occurrence in the case of the child treated at home as there is in regard to one who has been inhaling active infective matter at the hospital much more recently.

Supposing, then, the storing of infection in the nostrils to be the most common cause of return cases (and it is evident that infection is more likely to be stored there in bulk than elsewhere), the period of subsequent infection would necessarily be variable, being dependent on the discharge from the nostrils of an amount of infective material sufficient to lead to fresh infection.

The practical application of this view is that the various cavities about the head, and especially the nostrils, should be systematically disinfected in an isolation ward for at least a week before the patient is discharged.

The grounds on which this impression is founded may be stated as follows. In the first place, the cases occurring after the return of cases from hospital must be in great measure ascribed to those cases. This is readily seen from the following figures :—

TABLE SHOWING FOR 1894 AND 1895 THE INTERVAL IN DAYS BETWEEN THE FIRST AND SECOND ERUPTIONS IN THOSE CASES WHICH WERE REMOVED TO HOSPITAL, AND WHICH WERE FOLLOWED BY OTHER ATTACKS, NOT AFTER THE RETURN OF THE PATIENT. THE FIRST LINE GIVES THE INTERVAL IN DAYS, THE SECOND THE NUMBER OF SUBSEQUENT CASES CORRESPONDING TO THAT INTERVAL.

1894																						
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15–21	22–28	29–35	36–42	43–49	50–56	57–63	Over 63
22	16	18	21	11	8	6	7	6	5	9	3	4	6	7	17	7	4	0	2	1	0	1
1895																						
19	30	28	22	20	11	15	11	7	9	8	5	2	4	5	4	7	5	2	2	2	0	0

AFTER DISCHARGE.

PERIOD AFTER THE FIRST ATTACK IN DAYS WHEN THE SECOND CASE OCCURRED.

1894							
Interval in Days	41–50	51–60	61–70	71–80	81–90	Over	Total
No. of Cases	1	5	9	5	3	1	24
1895							
Interval in Days	41–50	51–60	61–70	71–80	81–90	136 Days	Total
No. of Cases	3	6	10	10	3	1	33

It thus appears that at the periods just preceding discharge—viz., from 36 to 56 days—in 1895 there were only 6 cases, as compared with 15 from 50 to 70 days after the first attack in those which had come in contact with a return case; in 1894, 3 at the same period at 36–56 days, as compared with 18 return cases in days 51–70. This must be held to show that other simultaneous influences have but little to do with it.

Having established that the occurrence is really due to something connected with the discharged patient, we have then to settle whether it has to do with his own condition, or whether something is superadded in the hospital.

Probably in former times the explanation of infected articles having been stowed away, and brought out on the return of the patient, may have been a real factor in the business. But I do not think it can now have much to do with it.

We are in fact brought down to two factors: infection remaining in the patient from his own illness, and infection which the hospital superadds.

To form some estimate of the former influence, I asked Dr. Marsden, of the Monsall Hospital, to give me the complications before discharge in a number of cases where discharge was followed by return cases.

These he was good enough to look up in regard to 48 successive return cases. In 12 instances there had been discharge from the ears at varying periods before the patients were sent home, and in some this condition existed at discharge. In two cases the glands of the neck were discharging. In two the glands were enlarged. In one case there was double purulent conjunctivitis two weeks before. In one there was nephritis, and in one nasal discharge. These conditions had, however, with the exception of some discharging ears, disappeared for some time. In five cases the skin was noted to be rough.

In Dr. Marsden's opinion there was nothing about the great majority of these cases which would have marked them out as likely to cause infection.

There is, however, nothing in his statement which informs us definitely whether the infection was or was not likely to have arisen from these cases.

Some light, however, may be thrown on this point by an examination of the records of patients treated at home. If the infection is solely or mainly due to the return patient's own illness, we should have a number of cases occurring when the patient is released from quarantine at home in proportion to the susceptible material remaining. What is the amount of susceptible material exposed to discharge cases, and to patients which have been treated at home respectively, could be calculated, though with some difficulty.

When, now, we examine the record of children treated at home, we find that in 1894 in only one household did the interval between the eruption of any case and the next exceed 20 days, and that in that household the interval between the first and second case was 20 days, between the second and third, 35 days.

The record for 1895 gives, however, more instances of attack after considerable intervals. If we take first the period exceeding 40 days, we have first a period of 64 days after the last previous attack in a family, and 14 days after the withdrawal of isolation from three previous cases; then we have a period of 59 days between the eruptions and 17 days after the removal of quarantine, then a period of 43 days, 11 days before the removal of quarantine. Next a period of 57 days, 20 days after discharge; then 45 days, 1 day before discharge; after that 64 days, 16 days after discharge; then 118 days, 54 days after recovery.

We have thus five cases comparable with the 33 which occurred after the return of cases from hospital. It will be observed, however, that not one of these cases comes within the circle of those in which Dr. Thompson admitted that there was satisfactory evidence of connection between the first and subsequent cases, except perhaps the first. He there excludes cases in which the second case took ill for a longer period than 14 days after the return or discharge of the first.

The contrast between these two classes of case is best exhibited in the form of a table, showing the number of days after the return of the first case in which the eruption appeared on the second case.

TABLE SHOWING FOR 1894 THE NUMBER OF CASES IN WHICH THE ERUPTION OCCURRED AT 1, 2, 3, &C., DAYS AFTER RETURN.

1894.

Interval in days	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Over 15	Total
Number of cases ...	...	0	1	3	4	2	0	1	2	1	2	1	0	1	0	1	5	24

Similar Table for 1895.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Over	Total
...	...	1	1	4	4	3	4	3	4	2	2	3	0	0	0	2	33

As we have seen, no second cases occur beyond an interval of six weeks in 1894 amongst those treated at home. In 1895 the table given above reduces to

14 days	Over 14 days
1	4

In two instances the patient had not been released from quarantine.

If we practise the exclusion which Dr. Thompson advocated, we have in 1894 amongst cases treated at home no return, as compared with 18 amongst hospital cases. In 1895 there would be 1 as compared with 31.

If, now, we examine the list of second cases treated at home in 1894 to see if there were any returns at earlier periods than 40 days after the eruption appeared in the first case, we find that in that year there were none.

In 1895, however, there were 2, at intervals after the first attack respectively of 34 and 37 days, and at intervals after release of the first case in both instances of one day. These cases were, however, manifestly released too soon, and similar intervals occur amongst cases which are still in quarantine in hospital.

These figures suggest very strongly that there is an infective material in the case of hospital patients released from isolation which does not exist amongst those discharged at home. Manifestly this cannot be clothing or desquamative cuticle, or discharges proper to the patient; and the only possible explanation is the lodgment of infection in the nasal passages, and possibly to some extent in the lungs.

This conclusion is reached on the supposition that the inquiry into the etiology of cases made by the sanitary inspectors is correct. This it can hardly fail to be, since the facts are such as could not well have escaped their attention, or the attention of the clerks in the Health Office. It also supposes that the facts for other periods would agree with those for 1894 and 1895. That is a criticism which all inquiries of this nature must and should undergo.

Assuming, however, that these figures represent a continuing state of things, what criticism may be fairly levelled at them? Of course the proportion of cases treated inside the hospital and at home is taken into consideration. In 1894 the proportion of all cases reported which was treated in hospital was 66 per cent.; in 1895, 71·3.

It may be said that the amount of susceptible material amongst patients treated at home was greater than in the case of patients taken to hospital. Doubtless that is so, though the disproportion is not very great.

Further, it may be surmised that, in the case of patients treated at home, there is not the same proportion of cases after recovery, because the available susceptible persons have been infected before recovery has taken place. That would be quite a justifiable criticism, and probably, to some extent, a just one.

I have before me a complete list, with all dates, of second cases occurring consequent on the removal of a case to hospital, and a similar list for cases occurring at home. The number of multiple cases in a household is, in proportion to the number of cases, greater in the case of hospital cases, apart altogether from return cases.

This, again, suggests another objection that a considerable proportion of the cases left at home are left in households where every care will be taken to prevent subsequent infection, and that in a large proportion of those removed no precautions to prevent subsequent infection will have been taken before removal.

This is, unquestionably, true. But, accepting every possible criticism, there would appear still to be left a remanent influence due to the hospital.

I have already said that I would try the isolation of cases in a separate convalescent ward for at least a week before discharge, the ears, mouth, and nostrils, especially the last named, being as far as possible thoroughly sprayed, or douched, with some antiseptic as little distressing as possible, while at the same time free discharge from the nostrils was encouraged.

The further history of infection may be briefly summarised thus:—I omit 1894 and 1895, and take only 1,000 cases from December, 1895, to April, 1896, of which I have prepared a summary, as these have received a fairly thorough investigation on the part of the inspectors. 214 of these were connected with previous cases of scarlet fever at home, which had been recognised. 60 were due, apparently, to overlooked cases: a number which I should imagine careful clinical inquiry would increase. 90 were traced, with more or less degree of probability, to previous cases at the same school. 21 seemed to have been contracted from playmates. 40 were traced to other infected houses directly or mediately, and 40 more were traced to sources which could not be thus classified. These inquiries often give matter of much interest, which, however, would swell this report to an undue size.

In addition to the above histories of infection, histories are given of possible return and recovery cases, which, however, are incomplete at present in the matter of dates and other particulars, and which require further examination. They give, overlooking dates, &c., 35 return cases at home and 7 outside the home, as against 6 recovery cases at home and 3 outside. These will, of course, require analysis. For an inquiry of the above nature, however, it would be safer to reject cases outside the house.

It only remains to be mentioned that numerous sanitary defects present themselves in connection with this and other fevers, of which a fairly complete record is now given by most of the inspectors, and that no case is now abandoned until the reports show that these have been completely remedied, so far as consists with our present procedures. It will be manifest that this entails the daily examination of a large number of reports which ought to undergo no remission.

Professor Delépine's Disinfector.

There is reason to believe that scarlet fever and diphtheria can be carried in clothing, and it is, therefore, very necessary that the clothes worn by those who have been for some time much in contact with the sick should be disinfected before they mix with people outside. This is a great difficulty in the case of poor people who have no change of clothing, and who, I am informed, could not be got to go to the disinfecting station. It must always be remembered that there is a danger, if too much rigour is exercised, of preventing disease from being notified, and I therefore cast about for some other way of getting over the difficulty. None appeared quite satisfactory, though a disinfector invented by Professor Delépine seems the best way of meeting it. This is a portable steam disinfector which can easily be carried about, and is capable of disinfecting several suits of clothes in 35 minutes from lighting the stove required to generate steam. Good clothes are provided by the Corporation for wear by the person whose clothes are being disinfected while the operation proceeds.

This disinfector is absolutely reliable, and is very inexpensive.

There is no doubt that this machine quite answers the purpose for which it is used, and, I should imagine, would be very useful in well-to-do private households.

On the Procedure in cases of Scarlet Fever. †

It may be useful here to state the course of action pursued when a case of scarlet fever comes to the notice of the Department.

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† This was prepared by Mr. Ellwood, with the aid of notes.

The heading of the inquiry form is filled in, and handed at 9 a.m. to the sanitary inspector, who thereupon visits the house, and enters up particulars relating to the other members of the family, which are essential in judging of the risk incurred in leaving the case at home. He enters up the school to which the patient goes, makes inquiries into the origin of the attack, describes the house, its surroundings and sanitary appurtenances, records the milk supply, and makes a special report on any matter of importance in etiology or sanitary condition. (At the end of this section will be found a memorandum which was drawn up to assist the inspector in his etiological inquiries.)

Supposing the patient is to be removed to hospital, he calls at the nearest police station and telephones to the Health Office, from which the message is given to the Ambulance Department. If the patient is not removed, he gives directions as to isolation, &c. In either case, copies of the precautions against the spread of infectious disease, and the law relating thereto, are given to the parents. On returning to the office the inspector hands in his inquiry form, which is next day submitted to the Medical Officer of Health, who reads it over, and notes any further inquiry which may be required or procedure which should be taken. A date is stated by which a further brief note must be made on the work done to remedy defects, and as considerable delay frequently occurs, these inquiry forms often undergo repeated examinations.

If the patient is removed to hospital, about the third day the house is disinfected, the principal means adopted being to wash all surfaces, including furniture, when possible, with a clear solution of chlorinated lime, 3oz. to the gallon, and the various articlesof clothing, bedding, mattresses, &c., are placed in bags and removed for disinfection.

If the patient is treated at home, the medical attendant signs a special printed form when he considers that isolation may cease, and the house is thereupon disinfected in the same manner.

The number of rooms disinfected depends on the degree to which the house has been exposed to infection, and on its sanitary condition.

The inspectors serve a twenty-four hours' notice on the occupier to cleanse and disinfect. This is done by the disinfectors at the expense of the Sanitary Authority, but not the papering, painting, &c., of the house. The work is superintended by the inspectors.

As regards school, a notice is sent in every case to the schoolmaster when the patient is attending school, giving hints as to diagnosis in subsequent cases.

This letter, which is subjoined, has now been in use over a year:—

Public Health Office,
Town Hall, Manchester,

..............................189

To the..

....

....

Dear Sir or Madam,

Great difficulty has been experienced in tracing the source of infection in cases of scarlet fever and diphtheria, often to be found in some slight overlooked case, which remains undiscovered and continues to spread infection. Particularly is this so with school children, who have exceptional opportunities for spreading disease. I subjoin the name and address of a child suffering from .... and believed to have been attending your school. I should be obliged if you would cause the teachers of the classes to which this child belongs to make enquiries with a view to ascertain whether any overlooked case has occurred in any of these classes. Especially necessary and valuable will this course of action be if two or more cases have arisen in the same class. Should such suspicion arise in regard to any child, if you will communicate with me I will have the illness investigated. The teachers should also be instructed at the same time to be on the outlook for any further cases of illness occurring in their classes, who should be sent home till all suspicion of infectious illness is removed.

In investigating the possibility of other cases in the same classes the following points should be borne in mind:—

SCARLET FEVER.

1. Children suffering from this disease are taken ill suddenly. The swift transition from good health to marked illness is a striking feature of scarlet fever.

2. When taken ill they become sick, and vomit, and are found to be very feverish. This may be ascertained by the teacher placing his hand on the child's forehead, having *previously* felt in the same way other children, by way of comparison.

3. Subsequently they have sore throat and a minute red rash, which generally appears the day after the commencement of illness. These symptoms, however, are not always present, and the teacher should not wait for their appearance.

4. After the lapse of a week from the commencement of the illness the skin begins to peel. This may be first seen on the face, ears, and neck, and subsequently on the fingers.

5. When trying to ascertain if any overlooked case has occurred in a class, the teacher should remember all these signs, at the same time bearing in mind that, usually, about the end of the first week there will be nothing to be seen, and that at this particular time there will only be the history of the illness to rely upon.

6. The teacher should enquire into the health of the classmates of the child whose name accompanies this paper for a week from the time of the child leaving school.

DIPHTHERIA.

This is much more difficult to trace than scarlet fever, and in trying to ascertain whether any previous or subsequent cases are to be found in the same class the teacher should be content to know if any of the other children have suffered from sore throat, and, subsequently, if any sore throats occur in the class.

Children suffering in this manner, however slightly, should be sent home.

You will greatly oblige me, and at the same time benefit the children under your charge, by taking these precautions, even should these enquiries in most instances lead to no discoveries.

I am, yours truly,

....

Medical Officer of Health.

Name	Age	Address	Day or Sunday School attending	Date of Illness

If a previous case or cases have recently occurred at a school, the following letter is sent to the head teacher :—

PUBLIC HEALTH OFFICE,
TOWN HALL, MANCHESTER,

........................18

Dear Sir,

—— children have been recently attacked with scarlet fever while attending your school, and there is danger of the disease attaining serious proportions. I should be glad if you would instruct your junior teachers to pay particular attention for some time to the health of the children, so that any child who is, or has recently been at all ill, may be sent home.

Children especially who have been recently sick, or who have suffered from headache and have slight sore throat, should be regarded as dangerous ; also any child whose skin is peeling on the hands should be excluded from school.

Books which have been used by a child attacked by scarlet fever or diphtheria should be withdrawn from general use, and if inexpensive, destroyed.

I am, dear sir,

Your obedient servant,

....

Medical Officer of Health.

I scarce need mention that if a case of scarlet fever occurs in a house where the patient is nursed at home the other children are excluded from school during the whole of the illness. In the case of children who are removed to hospital the other children are allowed to return to school seven clear days after disinfection, if no other cases have occurred in the meantime. This requirement is posted by letter card in the following form immediately the inspector has visited the house :—

CONFIDENTIAL.

Town Hall, Manchester,

...189

Dear Sir (or Madam),

The Sanitary Inspector for your District reports that

....

is present at..

which, I am informed, is the Residence of..

.... *Age*..................

a Pupil in attendance at your School.

Permit me to suggest, in the interest of the Public Health, that you should refuse to receive into your School any Pupils from this address, until the house has been certified by me to be free from infection.

I am, yours faithfully,

....

Medical Officer of Health.

To the Schoolmaster (or Mistress),

....*School,*

....

Sunday schools are also dealt with in the same manner, and if the schools are outside the municipal boundary the Medical Officer of Health for the district is communicated with.

Lists of notifications are sent daily to the Clerk of the School Board, and also a daily list of houses certified free from infection, for the information of the school attendance officers. Weekly lists of all children discharged from hospital, and of those dying, are also furnished to Mr. Wyatt.

The "Freedom from Infection" certificate is also handed to the day and Sunday schools by the inspectors, as well as to the houses.

Library books from an infected house are not again used, being either destroyed or sent to Monsall Hospital for the use of the inmates.

What, however, is not done, is, when a case occurs in a school, to separate the books used by the patient from those used by other scholars. This could be done if all books, slates, &c., were kept in a pigeon-hole arrangement, with numbers attached corresponding to numbers on the seats, each child to sit always by the same number.

If any material is being made into garments at an infected house, the goods, &c., are sent to the disinfecting station for stoving. These are then returned direct to the firm from whom the material was first received.

In cases of suspected infectious disease where no medical man is visiting, the practitioner usually attending the family is requested to see the case, and to send a certificate, for which he is, of course, paid; and where a medical man is attending another child in the same house, he is asked to examine the suspected case. This, evidently, has its drawbacks.

Memorandum for the use of Sanitary Inspectors in their inquiries into the origin of cases of Scarlet Fever, and as to the general course of action to be pursued in such cases.

1. On the occurrence of one case of Scarlet Fever in a house, enquiry is to be made whether any other member of the family has recently suffered from feverish illness, and especially from illness presenting the features of Scarlet Fever.

2. These features are, in children, *sudden illness*, with headache and sickness, followed by a rash and sore throat, and by fever; also, after some time, by peeling of the skin. All these symptoms are not, however, always present. Usually headache is present. Sickness is often absent. There may be no sore throat, and there may not even be any rash. Sometimes Scarlet Fever has to be inferred only from the sudden illness, with hot skin. The suddenness of the illness is an important sign. In adults the sickness is often absent.

3. Usually, about the end of the first week, all signs of illness have gone. Perhaps a little peeling may have started about the cheeks, ears, and neck. This is important, because it is possible to imagine that there has been no attack of fever, if no sign is visible.

4. After 10 days, signs of peeling will be present on the face, neck, and hands. All cases of Scarlet Fever, however, do not undergo peeling, and, therefore, a history of illness commencing suddenly with fever should always be recorded.

5. When two or more cases of Scarlet Fever occur at the same time in a family, you may almost assume that there has been a previous case in the house.

6. If no previous illness has occurred in the household, you should then enquire whether any playmate or neighbour's child has been previously taken ill with headache, sickness, &c.

7. Failing any evidence of illness from this source, your enquiries should then extend to the School at which the child was attending, and careful investigation should there be made as to previous cases of Scarlet Fever, or of illness which might reasonably be supposed to be Scarlet Fever. It is proposed, however, to obtain this information direct from the teacher, as far as practicable.

8. Enquiry should also be made as to whether the child has recently had new clothes, and, if so, whether infection can have been conveyed in the clothes.

9. The occurrence of illness at shops in the neighbourhood should always be enquired into.

10. The infection of Scarlet Fever is very difficult to dislodge when once it has got into a place, or has settled on clothing. It is, therefore, necessary to bestow particular care on seeing that all surfaces are properly disinfected with the chloride of lime solution, and that no clothing which has been used by the patient should escape disinfection. For the same reason, the greatest pains should be taken in having all articles which have been exposed to infection thoroughly disinfected.

MEDICAL OFFICER OF HEALTH.

PUBLIC HEALTH OFFICE,
TOWN HALL, MANCHESTER,
July 9th, 1895.

DIPHTHERIA.

Local Distribution.—The following table shows that during 1895 diphtheria was most prevalent in Newton Heath and Moston, and after that in Blackley and Cheetham.

DIPHTHERIA, MEMBRANOUS CROUP.—RATES OF ATTACK, 1895.

MANCHESTER TOWNSHIPS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY, PER CENT.	HOSPITAL REMOVALS, PER CENT.
Ancoats	17	0·37	17·7	23·5
Central	16	0·43	31·3	37·5
St. George's	38	0·60	34·2	15·8
Cheetham	42	1·39	26·2	31·0
Crumpsall	4	0·45	25·0	...
Blackley	15	1·93	46·7	26·7
Harpurhey	10	0·94	60·0	...
Moston	20	3·28	10·0	10·0
Newton Heath	83	2·30	13·3	19·3
Bradford	9	0·41	77·8	11·1
Beswick	2	0·19	50·0	...
Clayton	4	1·04	50·0	...
Ardwick	26	0·71	30·8	3·8
Openshaw	9	0·31	44·4	11·1
Gorton (West)	15	0·56	20·0	13·3
Rusholme and Kirk.	12	0·64	25·0	25·0
Chorlton-on-Medlock	46	0·75	19·6	13·0
Hulme	34	0·47	32·3	11·8
City of Manchester	**402**	**0·76**	**26·6**	**17·2**

† Corrected : the fatal cases are those occurring amongst the cases actually notified.

The above table shows the case fatality per cent. to be very different in different districts. It must not be supposed, however, that these figures are altogether reliable. There is a tendency to regard many throat affections as diphtheritic in their character, and scarlet fever, without eruption, is often mistaken for that disease. It will be observed that, while in Newton Heath and Moston the observed incidence of diphtheria is much greater than in other districts, the fatality is so much less as to bring the actual death-rate nearly to the same point as in several other districts, and below that in Cheetham and Blackley.

It will be seen, on comparing the tables giving the age distribution of cases of diphtheria and scarlet fever, that the proportion of cases of children under one year of age to older children is much the same for both diseases, although at ages above 15 there is a relatively larger number of cases of diphtheria. (See table on next page.)

DIPHTHERIA, MEMBRANOUS CROUP, 1895.

AGES	ATTACKS	DEATHS	CASE FATALITY, PER CENT.
Under one year...	21	16	76·2
1 to 2 years ...	30	17	56·7
2 to 3 „ ...	41	20	48·8
3 to 4 „ ...	43	17	39·5
4 to 5 „ ...	39	12	30·8
5 to 6 „ ...	26	11	42·3
6 to 7 „ ...	11	4	36·4
7 to 8 „ ...	13	3	23·1
8 to 9 „ ...	13	4	30·8
9 to 10 „ ...	7	1	14·3
10 to 15 „ ...	45	1	2·2
15 to 20 „ ...	25	1	4·0
20 to 25 „ ...	26	...	...
25 to 35 „ ...	35	...	...
35 to 45 „ ...	13	...	...
Over 45 „ ...	14	...	...
All ages...........	402	107	26·6

In the Annual Report for 1894, I advised that bacteriological examinations should be made of the cases before removal to hospital; and on February 3rd, by the direction of the Hospitals Sub-Committee, I sent the following circular letter to every medical man in the City:—

PUBLIC HEALTH OFFICE,
Town Hall, Manchester,
February 3rd, 1896.

Dear Sir,

At a Meeting held on January 29th, the Sanitary Committee of this City confirmed a resolution, passed by the Hospitals Sub-Committee, that facilities be afforded to Medical men in the diagnosis of cases of diphtheria. It is matter of common experience that many cases of diphtheria, especially those of a small degree of severity, are difficult to recognise. At the same time, if unrecognised, they are liable to spread the disease. On the other hand, if such slight cases are reported, it is not easy to get the patients to believe that they have suffered from so formidable a disease as diphtheria, or to induce them to have the requisite measures of isolation and disinfection carried out. In the same way, grave difficulties arise as regards the removal of such cases to hospital.

In order to obviate these difficulties, and to assist both the practitioner and the Health Office, the Sanitary Committee have arranged with the Council of Owens College and Professor Delépine to receive from him a diagnosis of the nature of material obtained from cases suspected to be suffering from diphtheria.

A number of tubes are kept at the Health Office in the Town Hall, each containing materials by means of which a practitioner can obtain, from a suspected case, matter for transmission to Professor Delépine at Owens College. These tubes are enclosed in a wooden case, on the outside of which are printed instructions for taking the matter for examination.

Medical men are requested to be careful to fill in the particulars asked for, as no bacteriological examination will be made in the absence of sufficient information.

Should the bacteriological examination show that the case is not one of diphtheria, the fee of 2s. 6d. for notification will be paid, just as if no bacteriological examination had been made.

On the other hand, if no bacteriological examination is requested, this will be regarded as a proof that the case reported admits of no doubt. Applications for tubes must be made to the Health Office. The tubes may afterwards be forwarded direct to Professor Delépine at Owens College. The diagnosis, again, can only be obtained from the Health Office. Professor Delépine wishes this to be clearly understood.

It is, however, the aim of the Sanitary Committee to shorten, as much as possible, the period between the first report of the case and the receipt by the Medical Attendant of the bacteriological diagnosis.

If the Medical Attendant will telephone to the Health Office, from the nearest Police Station, a request for a tube, this will be at once sent by messenger to his residence, or to the address of the patient, as the Medical Attendant may desire. If he is prepared at once to take a specimen for diagnosis, the messenger will wait to receive the tube from him, charged with the matter to be examined, and will convey it forthwith to Professor Delépine. The diagnosis will be given, to the Medical Attendant only, on the following day. It will be necessary, however, that the tube reach Professor Delépine by 3 p.m. on any one of the days Monday to Friday, and on Saturday by 1 p.m., otherwise the diagnosis will be delayed by one day. No diagnosis will be given on Sunday.

The expense of the bacteriological examination will be defrayed by the Corporation, and it is hoped that full advantage will be taken of the opportunities thus afforded.

In order that Medical men may familiarise themselves beforehand with the procedure which they will require to adopt, a copy of the instructions printed on the outside of the wooden case is enclosed.

JAMES NIVEN,

Medical Officer of Health.

The response was not very ready at first. But, in a short time, medical men having every facility given them, and recognising the value to them of the examination, began to send material from nearly every case that could be got to furnish it, and a bacteriological diagnosis is now made of nearly every living case, and occasionally of cases in which death has occurred.

The information so obtained throws considerable light on the previous history of the disease. Of 106 cases examined since February 6th, 69 have yielded no diphtheria bacilli; 2 have given indeterminate results; and thus only in 35 out of the 106 have positive results been obtained. In a large proportion of the cases it has been possible, of late, to say beforehand from the description obtained by the inspectors what the bacteriological examination would yield. This is a matter of much importance, since the majority of the cases which are not diphtheria are scarlet fever, and require quite as much attention as the disease for which they are taken. It is thus of moment, when the bacteriological examination is made the ground for not removing a case to the hospital, to know that we are not incurring as great a danger as we are leaving. Given this security, however, and the gain in safety to the patients removed to Monsall is manifest from the above figures. There is also a decided saving in the expense of isolation of patients. I am assured by Dr. Marsden that he finds this change in every way satisfactory.

From every point of view this departure must be looked upon as a gain. It is too soon yet to see what light it throws on the distribution of diphtheria, but it is abundantly clear that no conclusion can be drawn from previous allocations of the disease. I had, in Oldham, reached the conclusion that the diphtheria reported there was to a large extent scarlet fever. These more precise observations confirm that view as applied to Manchester. It is, moreover, a satisfaction to find that a diagnosis arrived at on clinical grounds, when that is possible, is confirmed by the bacteriological examination, since much more confidence is thereby inspired in both. The result of this improvement in the means of diagnosing diphtheria casts so much doubt on the particulars collected in reference to that disease that I consider it useless to say anything about them until sufficient genuine material has been collected.

With the above reservations as to their value, I now give the attack and death rates for 1895.

DIPHTHERIA AND MEMB. CROUP.—RATES OF ATTACK PER 1,000 OF POPULATION.

	1890	1891	1892	1893	1894	Mean	1895
Twelve Notification Towns ...	0·70	0·46	0·53	0·54	0·51	**0·55**	0·47
City of Manchester	1·20	0·90	0·97	1·20	0·98	**1·05**	0·76
Manchester Township.........	1·25	0·79	0·95	0·90	0·73	**0·92**	0·48
North Manchester	1·03	1·35	1·23	1·45	1·48	**1·31**	1·39
South Manchester	1·21	0·72	0·84	1·25	0·85	**0·97**	0·58

From the above table it will be seen that the case-rate in North Manchester was more than double that in either of the other divisions.

DIPHTHERIA MORTALITY.—RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
England and Wales	0·18	0·17	0·22	0·32	0·28	**0·23**	0·25
33 Great Towns	0·25	0·21	0·27	0·43	0·38	**0·31**	0·36
London	0·33	0·34	0·46	0·76	0·62	**0·50**	0·53
Manchester City............	0·36	0·25	0·25	0·35	0·29	**0·33**	0·21
Manchester Township	...	0·26	0·32	0·30	0·27	**0·29**	0·16
North Manchester	...	0·40	0·30	0·38	0·37	**0·36**	0·37
South Manchester	...	0·17	0·18	0·37	0·24	**0·24**	0·16
50 Smaller Towns	0·12	0·13	...	...	...	**0·13**	..
67 Smaller Towns	...	...	0·15	0·19	0·19	**0·18**	0·23
Rural Districts	0·15	0·15	0·16	0·24	0·24	**0·19**	0·19

Not only have the proceedings in regard to the diagnosis of diphtheria disposed of many difficulties, besides being economical in its working, but the results of treatment by injection with antitoxic serum have put the question of sending cases of diphtheria to the hospital on an entirely different footing. The percentage of deaths to cases treated in 1895 reached the remarkably low figure of 14·1, and I have thought that it would be of advantage, especially to the medical members of the Hospitals Sub-Committee, to have a statement from Dr. Marsden as to his experience of this departure. He has been good enough to furnish me with the following statement:—

On the experience of the treatment of Diphtheria at Monsall Hospital with antitoxic serum, by R. W. Marsden, M.B., B.Sc., &c.

Since November, 1894, it has been customary to treat all cases of diphtheria admitted into this hospital by means of the diphtherial antitoxic serum supplied by the British Institute of Preventive Medicine, and obtained through Messrs. Allen & Hanburys, Limited, London.

Tabulated statements have already been published in great number, comparing the results of this treatment with results previously recorded, but I am of opinion that personal experience of the two methods forms a most valuable factor in arriving at a judgment, and I wish here to lay special stress upon this factor.

GENERAL ACCOUNT.

Diphtheria is the result of the growth of a micro-organism upon some surface, notably the fauces and adjoining parts. When the growth attacks the larynx, there is danger of gradual asphyxia. As a result of this local growth, toxic substances are absorbed. The toxæmia may be so profound that death is caused by it directly, or, in less severe cases, it may give rise to a tissue degeneration, which shows itself as a nephritis, or, later still, by some form of paralysis.

The effect of the injection of the serum has, therefore, to be considered in connection with the following points :—

(1) The membranous deposits formed by the microbic growth.
(2) The toxæmia.
(3) Nephritis.
(4) Paralytic affections.
(5) Tracheotomy.
(6) Sequelæ.

(1) In mild cases, where the membrane is firm and not broken down, where there is no evidence of profound toxæmia, and where the urine is either normal or contains only a trace of albumen, the injection of the serum is apparently devoid of any effect during the first 24 hours, though adults who can express their feelings state that the throat "feels easier" within 12 hours. By the end of 36 hours, however, the membrane generally looks cleaner, whiter, and less firmly adherent to the mucous membrane. After 48 hours it seems distinctly thinner and less in extent, and in cases where the growth of membrane has been extensive, large flakes will often come away about this time; while by the end of 72 to 96 hours, the throat will in almost all cases be found to be perfectly clean, a little redness alone occupying the site where the membrane was formerly located. This rapid disappearance of the membrane I have observed in several instances in which no local treatment whatever was resorted to.

It may be said that, whereas in the days before injection the membrane took one to two weeks to disappear, it now disappears in three to four days.

In more severe cases admitted at a later period, when disorganisation of the membrane and ulceration have occurred, the disappearance is not always quite so rapid nor so complete.

In the case of laryngeal diphtheria this fact is of importance, since it enables one to state that if tracheotomy is not needed during 36 hours following the injection, it will almost certainly not be necessary at all.

(2) *Toxæmia.*—It is especially in regard to this symptom that the beneficial effects of antitoxic serum are observed.

Evidently several hours elapse before the system generally benefits from the influence of the antitoxic properties of the serum. Hence in many cases in which at the time of inoculation there are symptoms of cardiac failure from the toxæmia, or where there is evidence of the growth having extended into the bronchi, the disease has already progressed beyond hope of relief.

But, formerly, it was by no means uncommon to see patients admitted who were pale, with a growth of membrane on the fauces, &c., or in the larynx, causing slight stridor, and who, as the disease steadily progressed during the one or two days subsequent to admission, became gradually under observation slightly cyanotic about the lips, paler, weaker, the pulse getting smaller, the heart-beats weaker and irregular, and death occurring shortly after these indications of cardiac failure. Similarly, after tracheotomy, the breathing being immediately relieved, the patient would be apparently progressing favourably, save that the growth of membrane did not diminish or the glands at the angle of the jaw were increasing in size, when pallor became more pronounced, slight lividity and signs of cardiac failure supervened, and death followed some hours later.

With the exception of the rapid disappearance of the membrane, nothing has struck me more than the relative infrequency of this form of syncope due primarily to toxæmia, and since the introduction of the treatment by serum I have not seen it develop in a case which at the time of the inoculation showed no signs of cyanosis about the lips, no marked weakness, and in which the urine has only contained a trace or cloud of albumen.

(3) The presence of a considerable deposit of albumen in the urine, though not contra-indicating the use of antitoxic serum, markedly influences the prognosis. In one instance, the urine at the time of the injection, when boiled, was almost solid from coagulated albumen, yet recovery ultimately took place, though several weeks elapsed before the final disappearance of the albuminuria.

In many cases, however, where at the time of injection the urine is diminished in quantity, and the albuminous deposit is ¼ to ⅓ or more, the tide of events is not stemmed; the changes already produced have been apparently too severe, and the patient dies some days later from uræmia.

(4) In marked contrast with the effect upon syncope due to toxæmia directly is the effect of the serum upon the later form of syncope, which is apparently due to degeneration of the cardiac nervous supply. This forms part of the general implication of nervous tissue, which occurs as a result of the absorption of toxic substances, produced by the local growth of the diphtheritic bacillus. The injection of the serum prevents further degeneration, but, as in the case of diphtheritic nephritis, it cannot regenerate the tissues which have already been implicated before its injection, so that unfortunately we still too frequently see death occurring from syncope during convalescence.

Even in cardiac paralysis and post-diphtheritic paralysis of the muscles of the palate, limbs, eyes, &c., my own experience has been that it is decidedly less frequent than formerly, and I have never met with it since, save in patients in whom the general condition, and especially the appearance of the membrane on the throat, indicated that the disease had been in progress for a considerable time before admission.

(5) The growth of membrane in the larynx is accompanied by signs of laryngeal obstruction, and in a large number of cases tracheotomy becomes necessary to avert the threatened asphyxia. The serum having been injected, for 24 to 30 hours after the stridor may increase. In one of my cases tracheotomy became necessary 28 hours after the injection of the serum, yet within two days of the operation the patient could breathe quite easily through the mouth, with the tracheal wound closed. The operation, at all times fraught with danger, is less commonly followed by recovery after diphtheria than under other conditions. So sad had been the experience in this hospital up to the introduction of the use of antitoxic serum, that though humanity compelled it to relieve the sufferings of the patients, yet those in attendance invariably had the feeling that relief was purely temporary, and that the end would almost certainly be fatal.

During the last 18 months, however, a great change has been produced, and the feeling has rather grown that if death occurs in patients who have progressed favourably for two days, those in attendance begin to question themselves to see if they are not at fault. In a word, we have been successful during this period in discharging as cured over 50 per cent. of the cases operated upon. This percentage may seem small, but it must be remembered that in many instances after the laryngeal stridor has been relieved, the patient retains a slightly cyanotic tint, &c., showing profound toxæmia, or a certain amount of "bronchial wheeziness," with thick brown tenacious mucoid secretion, showing that the disease has progressed further into the respiratory tract, and in these cases the result is almost invariably fatal.

(6) I have never seen an instance in which serious consequences have followed the injection of the serum, and which could be definitely ascribed to its use. Usually 9 or 10 days after, urticaria develops upon some part of the body, it lasts for 1 or 2 days, and subsides without having caused any apparent discomfort. On one occasion it supervened as early as the 4th day after the injection, while the latest date at which I have met with it is the 13th day. On two occasions an acute inflammatory œdema developed round the vicinity of the injection, and subsided after some days without suppuration. In both of these instances the same antiseptic precautions had been used as in all the other cases.

R. W. MARSDEN, B.Sc., M.D. (Vict.),
Resident Medical Officer.

Monsall Fever Hospital,
July, 1896.

ON TYPHOID FEVER.

The following tables give a picture of the distribution of enteric fever in the City during 1895, of the amount of that disease compared with what has occurred in certain selected towns, of its fatality according to age, and of the actual death-rate in Manchester as compared with London, Dublin, and the country generally. The last table shows the incidence according to weeks in the year.

Enteric Fever Attacks, 1895.

Townships of Manchester	Attacks	Attack Rate per 1,000 living	† Case Fatality, per cent.	Removals to Hospital, per cent.
Ancoats	38	0·82	23·7	65·8
Central	25	0·68	28·0	60·0
St. George's	39	0·61	30·8	71·8
Cheetham	23	0·76	8·7	39·2
Crumpsall	7	0·79	14·3	14·3
Blackley	6	0·77	16·7	16·7
Harpurhey	10	0·94	...	10·0
Moston	5	0·82	20·0	40·0
Newton Heath	43	1·19	16·3	39·5
Bradford	21	0·95	33·3	47·6
Beswick	15	1·44	13·3	46·7
Clayton	3	0·78	33·3	100·0
Ardwick	32	0·87	15·6	43·7
Openshaw	46	1·61	23·9	45·6
Gorton (West)	45	1·68	11·1	46·7
Rusholme and Kirk.	27	1·43	14·8	25·9
Chorlton-on-Medlock.	38	0·62	15·8	21·1
Hulme	70	0·97	17·1	50·0
City of Manchester	**493**	**0·94**	**18·9**	**45·6**

† Corrected : the fatal cases are those occurring amongst the cases actually notified.

ENTERIC FEVER SICKNESS.—RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
Twelve Notification Towns...	1·01	1·09	0·90	1·85	1·32	**1·23**	1·45
City of Manchester	1·12	1·50	1·19	1·19	0·88	**1·18**	0·94
Manchester Township.........	1·07	1·37	1·18	0·93	1·04	**1·12**	0·70
North Manchester	0·99	1·36	0·94	1·08	0·73	**1·02**	0·98
South Manchester	1·21	1·65	1·33	1·42	0·86	**1·29**	1·06

ENTERIC FEVER, 1895.

AGES	ATTACKS	DEATHS	CASE FATALITY, PER CENT.
Under one year...	...	...	...
1 to 2 years ...	1	1	100·0
2 to 3 „ ...	10	2	20·0
3 to 4 „ ...	10	1	10·0
4 to 5 „ ...	12	2	16·7
5 to 6 „ ...	13	2	15·4
6 to 7 „ ...	11	1	9·1
7 to 8 „ ...	10	1	10·0
8 to 9 „ ...	13	...	...
9 to 10 „ ...	11	1	9·1
10 to 15 „ ...	65	4	6·2
15 to 20 „ ...	104	21	20·2
20 to 25 „ ...	77	18	23·4
25 to 30 „ ...	84	16	19·1
35 to 45 „ ...	46	13	28·3
Over 45 „ ...	26	10	38·5
All ages............	493	93	18·9

MORTALITY FROM ENTERIC FEVER.—RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
England and Wales	0·18	0·17	0·14	0·23	0·16	**0·18**	0·17
London...........................	0·15	0·13	0·10	0·16	0·15	**0·14**	0·14
Dublin	0·48	0·53	0·38	0·80	0·42	**0·52**	0·29
City of Manchester	0·27	0·37	0·24	0·25	0·17	**0·26**	0·18
Manchester Township.........	...	0·40	0·24	0·18	0·23	**0·26**	0·18
North Manchester	...	0·29	0·25	0·27	0·14	**0·24**	0·16
South Manchester	...	0·40	0·24	0·27	0·16	**0·27**	0·19

ENTERIC FEVER ATTACKS IN WEEKS ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 5	8	April 6	2	July 6	3	Oct. 5	17
,, 12	7	,, 13	4	,, 13	6	,, 12	16
,, 19	12	,, 20	6	,, 20	3	,, 19	12
,, 26	7	,, 27	9	,, 27	4	,, 26	17
Feb. 2	15	May 4	8	Aug. 3	8	Nov. 2	25
,, 9	11	,, 11	6	,, 10	6	,, 9	21
,, 16	9	,, 18	7	,, 17	8	,, 16	19
,, 23	9	,, 25	10	,, 24	9	,, 23	20
Mch. 2	10	June 1	13	,, 31	6	,, 30	9
,, 9	4	,, 8	8	Sept. 7	8	Dec. 7	10
,, 16	5	,, 15	6	,, 14	12	,, 14	15
,, 23	9	,, 22	6	,, 21	8	,, 21	6
,, 30	4	,, 29	5	,, 28	19	,, 28	6
Total...	110	Total...	90	Total...	100	Total...	193

City Total 493

Last year it was stated that although the incidence of typhoid fever on the different districts was very various, nevertheless, both in 1891–93 and in 1894, the attack rate was highest in West Gorton and in the Central Division of the Township.

In 1895 the attack rate is, again, highest in West Gorton, while after that district it is greatest in Openshaw, Beswick, Rusholme, and Newton Heath.

It is by no means easy to say what value is to be attached to these figures, since a large section of the cases reported are not cases of typhoid fever, but of some other disease.

The mortality in Manchester in 1895 is but little above that of the country generally, maintaining in that respect the advantageous position which it assumed in 1894. This is probably due, to some extent, to the provision of special pails to receive the excreta and washings from cases treated at home.

It was pointed out in the Report for 1894 that, up to that year, no steady decrease since 1881 had occurred in this City such as had occurred in other large centres of population, and the continuance of the high attack and death-rate was believed to be due to the condition of the privies and drainage. It is to be hoped that the reduction shown during the last two years may continue. But there is nothing in the state of the closets to warrant such an expectation.

It is a very difficult matter to determine in a city the origin of sporadic cases of enteric fever. Assuming that the infective matter is contained in the discharges from the bowel, it is likely, first of all, to assail the attendants on the sick, whether by direct aërial infection consequent on the drying of motions in the bedroom, or by soils adhering to the hands or clothes of the attendant or visitors, and subsequently affecting their food. There are abundant examples of this mode of infection.

The disease may also, as has been proved, be conveyed in the clothes worn by the sick person, unless these have been previously disinfected, and may thus assail fresh persons. In this way friends and laundry-women have been attacked.

It may be carried into middens and privies and the germs of the disease may there multiply. If these are defective, and allow soakage into the soil, the infective matter may there multiply and infect fresh persons. The urine discharged from infected persons may thus prove a source of danger, since in some cases it contains the germs of the disease.

The infective matter may often get into the sewers, and by them be carried considerable distances. Since it possesses considerable power of growth, it may thus travel, especially in defective or stagnant sewers or drains, contrary to the course of the drain. All leaking drains in the path of the infectious matter become a source of danger.

It may be carried long distances in infected water, milk, or shell-fish. It may have got into food prepared in unsuitable places or from unsuitable materials, such as many ice-creams.

Since the bacillus of the disease possesses great power of growth in very dilute organic solutions, a very small amount, accidentally inoculated in suitable soils, such as broth or cooked potatoes, may soon multiply into an infection sufficient to produce the disease. It may thus spread from an ill-cared-for case to neighbouring houses.

With all these and other possibilities it is evident that we may have great difficulty in ascertaining what has given rise to particular cases.

In fact, these cases are rarely traced, and the difficulty is much aggravated by the uncertainty of the diagnosis.

As regards any conclusions which could be arrived at in regard to the distribution of the disease, the Reports of the Sanitary Inspectors for 1895 were of very little use, and I found it necessary to supplement the directions for the prevention of the disease given by Dr. Tatham by further information in regard to the disease, which was given to the Inspectors in the form of an extempore address, since printed. I find, however, that it will be necessary to go over the subject again from another point of view.

Since the memoranda in relation to disease were put into the hands of the Inspectors, the reports in reference to this, as to other diseases, have much improved.

Nevertheless, it has been so far impossible to discover in what manner the great majority of cases are conveyed.

No connection with water or milk supply has, in any of the cases, been discovered, and we are, therefore, driven to look to the state of the privies and drainage for an explanation. There is, assuredly, in these plenty of defects, and conditions in abundance which might be expected to lead to disease, but no connection as a rule with previous specific sources of infection. Nevertheless, it can be clearly shown that the conditions of the closets, or of the ground connected with them, have a definite and decided effect, in this city, on the production of typhoid fever, however the specific infection may, in the first instance, have reached them.

The proportion of middens to pails throughout the City is about 1 to 3½. There are now rather more water-closets than middens, but as the vast majority of the former are in the warehouses, &c., of the City it was not considered possible to obtain anything definite bearing on the connection between water-closets and typhoid fever.

In trying to ascertain the connection between the form of privy and the incidence of typhoid fever, it was therefore proposed, in the first instance, to leave water-closets out of account, and to assume, as a first approximation, that what influence was exerted was due to the privy used at home. The result is exhibited in the table on page 56, the suggestions made by which are sufficiently striking.

From this table it will be at once seen that while in the earlier part of the year and in December the proportion of enteric houses with pail closets exceeds those with middens, generally speaking, in a proportion in excess of 3½ to 1; in the autumn months this proportion diminishes in a remarkable degree year after year. In other words, the middens assert in autumn a disastrous influence which is not shown in the colder periods of the year.

The invariable occurrence of this phenomenon stamps the influence of the middens and of the adjoining ground in the production of this fever with an unmistakable distinctness.

It will be remembered that while the pails are emptied once a week or oftener, the middens are often not emptied for months, so that the infective material has time to grow. It is especially in autumn that the consequences of the capacity for growth of the typhoid bacillus might be expected to be manifested.

STATEMENT OF THE NUMBER OF PAIL CLOSETS, MIDDENS, ETC., ATTACHED TO HOUSES IN WHICH ENTERIC FEVER HAS OCCURRED.

		January	February	March	April	May	June	July	August	September	October	November	December
1891	Pails	40	45	32	47	35	21	18	26	58	74	78	75
	Middens	16	11	15	15	7	7	5	8	27	28	14	14
	Water Closets	1	...	...	2	1	...	1	2	1	3	2	1
	Pails and W.C's	...	2	1	1	1	2	..	1	2	2	4	2
	Middens and W.C's	...	...	...	...	...	...	...	1	1	2	...	...
1892	Pails	53	40	42	23	32	23	28	29	45	34	46	43
	Middens	6	8	7	13	10	1	5	12	23	12	27	12
	Water Closets	1	2	...	...	3	...	1	...	2	6	5	2
	Pails and W.C's	1	1	1	...	1	...	3	1	7	2	2	1
	Middens and W.'Cs	1	...	...	...	...	...	...	...	1	...	...	...
1893	Pails	31	24	26	23	11	24	19	30	48	55	48	30
	Middens	9	8	5	4	3	8	16	27	42	32	21	9
	Water Closets	...	...	1	2	...	...	4	1	6	3	4	2
	Pails and W.C's	2	...	1	1	...	1	3	...	6	3	2	...
	Middens and W.C's	1	...	...	...	...	2	...	...	1	1	...	2
1894	Pails	48	31	31	24	20	15	20	36	33	36	30	24
	Middens	3	7	4	5	4	3	2	10	6	16	17	9
	Water Closets	3	...	1	1	1	1	1	6	2	2	5	2
	Pails and W.C's	...	...	...	...	1	1	1	1	...	3	1	...
	Middens and W.C's	...	...	...	...	...	...	...	...	...	1	2	1
1895	Pails	33	25	34	14	19	30	8	15	16	28	...	...
	Middens	5	6	1	4	4	8	9	14	19	15	...	...
	Water Closets	3	5	...	3	3	2	1	...	1	1	...	...
	Pails and W.C's	...	2	...	...	2	1	...	...	...	1	...	...
	Middens and W.C's	...	1	...	...	...	...	1	...	...	1	...	...

If, however, this supposition is correct, then we should expect even a closer connection between secondary cases in a house and the class of privy; and such, indeed, we find to be the case, as the table on page 58 shows.

Now, whatever may be the precise interpretation put on these figures, there can, I think, be no doubt that they establish a direct connection between the character of the privy and of the soil surrounding it and the incidence of typhoid fever.

It may be possible to arrive at some conclusions in relation to the connection between water closets and privies, still on the same supposition of a first approximation. But this will entail considerable labour, which cannot be incurred at present.

The relation of the privies to typhoid fever may, also, be considered from the same point of view as we have adopted in the case of scarlet fever, viz., from the relations of particular cases.

If we take the first cases reported in 1896 we find that at 13 houses water-closets were in use, at 117 pails, and at 24 middens.

As regards the pails, in 59 these adjoined houses, in five they were within 4 feet, and in 53 they were at a distance of 4 feet or more from the houses.

Of the 59 adjoining houses 25 were without urine guides, and of the five within 4 feet four were without urine guides. Further, 13 others had sunk or wet floors.

Thus, of the 64, 42 were in such a condition as to lead to gross pollution of the soil.

Of the 53 not within 4 feet, 13 were without guides, and 12 had wet or sunk floors.

This, it will be observed, makes a picture similar to that presented by scarlet fever.

Of the 24 middens, seven adjoined the houses, four were within 6 feet, and 13 were beyond this distance.

These figures, as I have explained, cannot be pressed too far, because of diagnostic shortcomings. Considering the success attending the bacteriological examination in cases of diphtheria, it is well worth considering whether an attempt should not be made to extend this method of analysis to cases of typhoid fever before admission to hospital. I am of opinion that it should, and there is reason to believe that a diagnosis may now be made as speedily for typhoid fever as for diphtheria.

I have explained that the origin of cases of typhoid fever is to be found, generally, in something which has been swallowed. The above results suggest that the infection may be aërial, at all events in a portion of the cases, and it is well known that typhoid fever is occasionally ushered in by an attack of pneumonia.

Enteric Fever.—Houses in which subsequent cases have occurred.

	1891				1892				1893				1894				1895				1891—1895	
	Pail	Midden	W.C.	P. and W.C. or M. and W.C.	Pail	Midden	W.C.	P. and W.C. or M. and W.C.	Pail	Midden	W.C.	P. and W.C. or M. and W.C.	Pail	Midden	W.C.	P. and W.C. or M. and W.C.	Pail	Midden	W.C.	P. and W.C. or M. and W.C.	Pail	Midden
January	7	2	...	...	6	1	...	...	...	1	...	...	8	...	...	...	2	1	...	...	23	5
February ...	7	2	...	...	4	1	...	...	1	...	...	...	2	1	...	...	...	...	...	...	14	4
March.........	2	1	...	...	1	...	...	...	1	...	...	...	2	...	...	...	3	...	...	...	9	1
April	3	1	...	...	3	2	...	...	1	...	...	...	2	...	...	...	...	1	...	...	9	4
May	4	1	...	...	2	1	...	...	...	...	...	...	3	...	...	...	2	...	...	...	11	2
June	3	...	...	1 P. & W. C.	...	...	...	...	2	2	...	...	1	...	...	...	2	1	...	...	8	3
July	1	...	...	...	3	...	...	1 P. & W. C.	2	3	...	...	1	...	...	...	...	...	...	...	7	3
August	5	3	...	...	2	3	...	...	2	2	...	...	3	...	1	...	1	1	...	...	13	9
September ...	3	3	...	...	4	4	1	2 P. & W. C.	4	3	1	1 P. & W. C.	...	2	...	...	1	...	...	...	12	12
October	9	4	...	1. M& W. C.	1	1	...	...	6	3	...	...	3	...	...	...	1	1	...	...	20	9
November ...	7	...	...	...	5	3	1	...	2	3	...	...	2	1	...	...	...	...	...	...	16	7
December ...	2	...	...	...	5	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	9	1
	53	17	...	2	36	17	2	3	22	17	1	1	28	4	1	...	12	5	...	...	...	...

Still the alimentary tract may be regarded as the most common channel for the introduction of infection, and recently observations have pointed to oysters and mussels as forming a means of conveying the disease. Now, inquiries have been made in a number of the 162 cases to which the above particulars relate, though by no means in all, relating to this point, and in 17 it was found that mussels or oysters, or both, had been eaten by the patient at a period compatible with the introduction of infection by this means. In 6 instances icecream, and in 4 chip potatoes had been used at a corresponding period. The large number of instances in which shell-fish had been eaten raw is, at all events, notable.

As regards introduction of filth into drinking water, although the path taken by the water-pipes was often found to be a perilous one, in only two or three instances was it noted that leakages had occurred which would have made it possible for anything to enter the water.

No suspicion whatever has been thrown on milk. That may partly be owing to ignorance of the ramifications of the milk trade.

It has been stated that typhoid fever appears to be the result of direct infection from previous cases in a certain number of instances, and it is, therefore, of great moment for preventive purposes to ascertain by what channels it is conveyed. The most likely are these :—

(1.) By direct aërial conveyance of infective material. Such material may be derived either from the discharges, or, possibly, from the eruption. In both instances the danger would appear to be greatest from the early part of the second week onwards for a fortnight.

It is manifest that, supposing this the source of danger, the attention of the attendant must be directed especially to preventing enteric discharges from becoming dry, and that special means should be taken to receive and at once make harmless any involuntary discharges. The skin should at the same time be cleansed with some antiseptic material such as a 5 per cent solution of carbolic acid. It is worth considering whether the skin should not be oiled with carbolic oil over those parts on which the maculae have made their appearance.

(2.) The disease may be communicated by infection of the hands of the attendant, and subsequent contamination of food, or the food, if kept in the sick-room, may be directly contaminated. It is manifest that no food or drink which has entered the sick-room should be partaken of by any but the patient, and that the attendant's meals should be taken outside. Moreover, the attendant should never partake of food, except with perfectly clean hands. In his "Precautions," Dr. Tatham drew special attention to this requirement.

(3.) The greater part of the infective matter, however, is contained in the excreta. This should, therefore, be received into a disinfectant, and placed in a special receptacle (which is provided) not used by the rest of the family. Now, as I have previously said, the infective matter appears in the discharges, according to some exact observations, about the ninth day. Hence, if the disease has not been recognised until after that period, infected matter will have been deposited in the privy used by the rest of the household, and from there may find its way into the systems of other members of the family, either directly from the privy, or by growth in the soil. This danger is, perhaps, greatest in the case of midden privies.

It is, thus, of interest to know how far the privies are likely to have been infected before subsequent cases occur, and also what is the condition of the privies in cases of infection.

The particulars of such cases, selected in 1896, bearing on these points are shown in the table on page 61.

It will thus be seen that as many as 34 cases occur in the same households as previous cases, whether as the result of infection from the previous case or as the result of the same infection continuing there is nothing absolutely to indicate. It is only from the result of other observations that we are permitted to suppose that, in all probability, a number of them were due to infection one from the other.

In this series of 25 houses, only 2 have midden privies, 4 have water-closets, and 19 have pails. Of the 19, in only 2 is the condition of the closet not noted to be bad.

So far then as these particulars go, and remembering that the urine of enteric cases has been found to contain the infection of the disease, it may be said that, if the subsequent cases occurring in a household are to be regarded as due to infection from previous cases, the condition of the closets is such as would have specially favoured transmission by their means.

In only one instance is the attack referred to the occurrence of the disease in an adjoining house. It may be fairly argued that if the pollution of the soil is a powerful factor in the production of this disease—as an immediate consequence—such occurrences might be expected to be more common.

An examination of the particulars given shows (1) that in the majority of instances the case was reported at a period when it should have been possible to prevent subsequent infection by means of the privies, but by no means in all; (2) that the relationship is often such as might have led to direct infection.

It should be mentioned that in all cases where danger through the privy is to be anticipated, it is disinfected by means of the solution of chloride of lime, 3oz. to the gallon.

CASES TRACED TO PREVIOUS CASES.

Progressive No of case	Relation borne by the previous case or cases to that under consideration	How long had the previous case been ill before being reported	Onset of subsequent case. How long after first	STATE OF PRIVY						Yard drains	Drains bad
				Pail				Midden adjoins	Distance		
				Adjoins	Distance	Guide off	Flow wet or defective privy				
1	Daughter	7 days	34 days	+	...	...	+	...	...	...	...
8	Sister	7 ,,	52 ,,	...	...	...	...	+	...	...	+
9	Father and daughter	27 ,,	78 ,,	+	...	+	+	...	...	...	...
11, 83	2 sons	9 ,,	69 ,,	...	15 feet	+	...	...	...	Good	...
16, 39, 40, 63	3 sisters and 1 brother	7 ,,	30 ,,	...	8 feet	+	...	...	...	Good	...
19	Sister and brother	1 ,,	54 ,,	W.C.	...	...	...	...	...	Good	...
90	Brother	7 ,,	19 ,,	...	9 feet	+	...	...	...	Bad	...
96, 97	2 sons	13 ,,	5 ,,	...	...	...	...	...	15 feet	Good	...
115	Son	3 ,,	2 ,,	...	4 feet	+	+	...	...	Good	...
123	Daughter	37 ,,	7 ,,	...	...	...	...	...	...	...	...
124	Sister	9 ,,	6 ,,	...	15 feet	...	+	...	...	...	...
137, 169	Father and son	12 ,,	46 ,,	W.C.	...	...	...	...	...	Good	...
155	Sister	23 ,,	14 ,,	+	...	+	+	...	...	...	+
159	Mother	8 ,,	43 ,,	+	...	+	...	...	...	...	...
172, 181	2 sisters	7 ,,	92 ,,	+	...	...	...	...	...	...	...
173	Brother	27 ,,	4 ,,	...	40 feet	...	+	...	...	...	...
194	Lodger	10 ,,	30 ,,	+	...	...	...	...	...	Good	...
199, 200, 221	Mother	27 ,,	47 ,,	+	...	+	...	...	...	...	...
243	Husband	7 ,,	51 ,,	...	8 feet	...	...	...	...	...	...
247	Brother	12 ,,	40 ,,	...	7ft. 6in.	+	...	...	...	...	...
250	Brother	9 ,,	103 ,,	...	4 feet	...	...	...	...	Good	...
80	Brother	Overlooked case	...	...	...	...	...	...	...	...	...
167	Sister	...	...	W.C.	...	...	...	...	...	...	...
113	Mother	...	...	+	...	...	...	...	...	...	...
196	From adjoining house	...	...	W.C.	...	...	...	...	...	...	...

SMALLPOX.

There was very little smallpox in Manchester in 1895, and the majority of the cases occurred in Openshaw, in which district there was a limited outbreak in the third quarter. This district is removed alike from tramp and from hospital influence, and the outbreak was unquestionably due to the earlier cases not having been recognised, although by no means obscure in their character. Of the 50 removed to the hospital only two died.

The figures for smallpox for the years 1892–95 are given, in order to show how greatly the fatality is governed by the absence of vaccination. In 1895 the disease was nine times as fatal to unvaccinated as it was to vaccinated patients.

Over the four years it was six times as fatal. The subject is discussed at more length in the Report for 1894.

Clayton Hospital, again, did excellent service in 1895, and not a shadow of suspicion arose as to the operations there having given rise to cases of the disease. It is true the numbers were not large.

The following tables exhibit the distribution of smallpox during its recent, somewhat prolonged prevalence, and give details in respect of 1895.

SMALLPOX ATTACKS, 1895.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Week ending	Attacks	Week ending	Attacks	Week ending	Attacks	Week ending	Attacks
Jan. 5	...	April 6	...	July 6	...	Oct. 5	...
,, 12	...	,, 13	...	,, 13	1	,, 12	...
,, 19	...	,, 20	1	,, 20	...	,, 19	...
,, 26	...	,, 27	2	,, 27	3	,, 26	1
Feb. 2	...	May 4	1	Aug. 3	2	Nov. 2	...
,, 9	...	,, 11	...	,, 10	3	,, 9	2
,, 16	...	,, 18	1	,, 17	4	,, 16	...
,, 23	...	,, 25	...	,, 24	3	,, 23	1
Mch. 2	...	June 1	1	,, 31	2	,, 30	...
,, 9	...	,, 8	1	Sept. 7	5	Dec. 7	...
,, 16	...	,, 15	2	,, 14	2	,, 14	...
,, 23	...	,, 22	3	,, 21	7	,, 21	...
,, 30	...	,, 29	...	,, 28	3	,, 28	...
Total...	...	Total...	12	Total...	35	Total...	4

SMALLPOX ATTACKS, 1895.

TOWNSHIPS OF MANCHESTER	ATTACKS	ATTACK RATE PER 1,000 LIVING	CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL. NUMBER
Ancoats	...	...	...	...
Central	4	0·11	...	4
St. George's	1	0·02	...	1
Cheetham	5	0·16	...	5
Crumpsall	...	...	...	...
Blackley	...	...	...	...
Harpurhey	...	...	...	...
Moston	...	...	...	...
Newton	...	...	...	...
Bradford	...	...	...	...
Beswick	5	0·48	...	5
Clayton	...	...	...	...
Ardwick	...	...	...	...
Openshaw	31	1·09	6·45	30
Gorton West	...	...	...	...
Rusholme and Kirk.	...	...	...	...
Chorlton-on-Medlock	3	0·05	...	3
Hulme	2	0·03	...	2
City of Manchester.	**51**	**0·10**	**3·92**	**50**

SMALLPOX ATTACKS, 1892–93–94–95.

TOWNSHIPS OF MANCHESTER	ATTACKS	ATTACK RATE PER 1,000 LIVING	CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL. NUMBER
Ancoats	133	0·71	6·76	133
Central	100	0·67	4·00	100
St. George's	285	1·13	7·72	280
Cheetham	33	0·28	12·12	33
Crumpsall	16	0·48	18·74	16
Blackley	9	0·30	11·11	9
Harpurhey	24	0·61	8·33	24
Moston	27	1·17	11·11	26
Newton	197	1·39	6·09	197
Bradford	14	0·16	7·14	14
Beswick	11	0·27	...	11
Clayton	...	...	...	...
Ardwick	20	0·14	...	20
Openshaw	40	0·37	5·00	39
Gorton West	25	0·24	8·00	24
Rusholme and Kirk.	5	0·07	20·00	5
Chorlton-upon-Medlock	48	0·20	8·33	44
Hulme	71	0·25	4·25	71
City of Manchester	**1,058**	**0·51**	**6·91**	**1,046**

The particulars relating to the attacks for the whole City during the years 1892–95, as well as the facts observed in Manchester in respect of the influence exerted by vaccination, are very fully set out in the following tables :—

SMALLPOX TREATED IN HOSPITAL, 1892–93–94–95.

TABLE SHOWING THE PERCENTAGE OF DEATHS IN CASES OF SMALLPOX, VACCINATED, UNVACCINATED, AND WITH NO MARKS OF VACCINATION, AT GROUPS OF AGES.

	ALL AGES						0—5						5—15						15—25					
	VACCINATED		UNVACCINATED		DOUBTFUL		VACCINATED		UNVACCINATED		DOUBTFUL		VACCINATED		UNVACCINATED		DOUBTFUL		VACCINATED		UNVACCINATED		DOUBTFUL	
	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths
1892-93-94-95	886	35	107	28	53	7	1	...	28	9	1	...	94	...	37	7	11	...	273	2	23	5	9	1
Case fatality per cent.	3·95		26·17		13·21		...		32·13		...		...		18·92		...		0·73		21·74		11·11	

	25—45						45—65						65 AND UPWARDS					
	VACCINATED		UNVACCINATED		DOUBTFUL		VACCINATED		UNVACCINATED		DOUBTFUL		VACCINATED		UNVACCINATED		DOUBTFUL	
	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths	Attacks	Deaths
1892-93-94-95	445	26	16	5	19	4	68	7	2	2	11	1	5	...	1	...	2	1
Case fatality per cent.	5·84		31·25		21·05		10·29		100·00		9·09		...		...		50·00	

SMALLPOX ADMITTED TO HOSPITAL FROM THE CITY OF MANCHESTER.

Table showing the Attack-rates and Death-rates from Smallpox per 1,000 living at Groups of Ages in Vaccinated and Unvaccinated Persons, and among those not known to be Unvaccinated but having no marks of Vaccination.

YEAR	ALL AGES						0–5						5–15						15–25						25–45						45–65						65 AND UPWARDS					
	Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful		Vaccinated		Unvaccinated		Doubtful	
	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died	Total Admitted	Died
1892	95	2	19	2	2	...	...	...	3	1	...	...	8	...	6	...	...	...	28	...	5	1	...	...	50	1	4	...	1	...	8	1	...	...	1		1		1		...	...
1893	504	22	60	17	37	5	...	...	18	5	...	...	54	...	19	3	9	...	159	1	11	3	8	1	247	17	11	5	10	2	41	4	1	1	8	1	3	...	...	...	2	1
1894	242	10	23	8	14	2	1	...	4	2	1	...	24	...	10	4	2	...	75	1	7	1	1	...	125	8	1	...	8	2	16	1	1	1	2	...	1	...	...	...	...	...
1895	45	1	5	1	...	...	...	...	3	1	...	...	8	...	2	...	...	...	11	...	...	...	...	...	23	...	...	...	...	...	3	1	...	...	...	..	...	...	...	...	...	...
Population at Age Groups 1892	513,196						64,335						114,521						103,699						148,682						68,839						13,120					
1893	517,760						64,914						115,564						104,630						149,989						69,424						13,239					
1894	522,365						65,499						116,615						105,571						151,306						70,017						13,357					
1895	527,010						66,093						117,676						106,516						152,636						70,612						13,477					
	ALL AGES						0–5						5–15						15–25						25–45						45–65						65 AND UPWARDS					
1892	0·19	0·00	0·04	0·00	0·00	...	...	...	0·05	0·02	...	...	0·07	...	0·05	...	...	...	0·27	...	0·05	0·01	...	...	0·34	0·01	0·03	...	0·01	...	0·12	0·01	...	...	0·01	..	0·08	...	0·08	...	...	...
1893	0·97	0·04	0·12	0·03	0·07	0·01	...	...	0·28	0·08	...	...	0·47	...	0·16	0·03	0·08	...	1·52	0·01	0·11	0·03	0·08	0·01	1·65	0·11	0·07	0·03	0·07	0·01	0·59	0·06	0·01	0·01	0·11	0·01	0·23	...	...	...	0·15	0·08
1894	0·46	0·02	0·04	0·02	0·03	0·00	0·02	...	0·06	0·03	0·02	...	0·21	...	0·09	0·03	0·02	...	0·71	0·01	0·07	0·01	0·01	...	0·83	0·05	0·01	...	0·05	0·01	0·23	0·01	0·01	0·01	0·03		0·07	...	...	...	...	...
1895	0·09	0·00	0·01	0·00	..	...	...	...	0·05	0·02	...	...	0·07	...	0·02	...	...	...	0·10	...	...	...	...	...	0·15	...	...	...	...	...	0·04	0·01	...	...	...		...	...	...	...	...	...

Smallpox Sickness Rates (all Attacks), 1895.

City	Township	Northern	Southern
0·00	...	...	0.01

The history of the limited outbreak in Openshaw in 1895 is interesting, as it illustrates several features in our modern relation to the disease. On several occasions, cases of smallpox were regarded as being cases of chicken-pox, an error which is found on all occasions to have a marked effect on the propagation of smallpox. It is an error which one moderately acquainted with infectious diseases finds it difficult at all times to avoid, and it occurs with undue frequency in proportion as many practitioners have never had the opportunity of seeing smallpox on a scale adequate to enable them to be sure of the more difficult cases. From my own experience, I am sure that this is an important factor in the continuance of smallpox in our cities. Vaccination, in all other ways our ally, is here an insidious enemy, as it has the effect of so modifying and mitigating the attack as to minimise the points of distinction. All we can do in regard to this difficulty is to endeavour to utilise such cases of smallpox as occur for the instruction of students of medicine.

Nevertheless, it also appears that where we can ensure prompt vaccination of those exposed to infection, when we do become acquainted with the presence of smallpox, we can arrest its spread, where no other unfavourable influences are at work.

The figures relating to the attack-rate and death-rate of the recent somewhat prolonged prevalence of smallpox are given in a complete form.

They serve the purpose of keeping before us, from our own experience, what has been the nature and the extent of the protective influence which we have derived from vaccination. These figures are quite independent of the enforcement or the neglect of vaccination which may exist, although they hold out a strong inducement to the public to protect their children by vaccination, and themselves by revaccination.

As regards the rate of attack at different ages, it will be seen that amongst the vaccinated, this is nearly nil in childhood, although at school ages 5–15 it has already become marked. It is, however, much greater at the ages 15–25 and 25–45, from which period it declines.

No vaccinated child died in any of the years 1892–95 either at the ages 0–5 or 5–15, and at the ages 15–25 only two vaccinated persons died in the four years. A study of the figures will make it clear that the protection afforded by vaccination against a fatal issue is of much longer duration than the protection against attack.

When, now, we pass to the next age period (25–45), we discover that there has been a great loss of protection to life in the vaccinated : a loss which is still more conspicuous at the ages 45–65.

We have no means of comparing the relative incidence of attack on the vaccinated and on the unvaccinated, and the rates of attack given in the table refer simply to the population at different ages. Turning now to the unvaccinated attack rates, we find that they follow a course precisely the reverse of that followed by the attack rates of the vaccinated.

They are, in the unvaccinated, greatest at the ages 0–5, and gradually diminish as the age period advances, although not rapidly. That they do not diminish more rapidly is due to the greater exposure of the average unvaccinated adult to infection.

Now, assuming that there is an unbroken gradation in the number of cases of vaccinated and unvaccinated—and this may be taken to be so over the whole population of the City—then, so far as the limited figures go, this table presents a very good picture of the kind and extent of protection afforded by vaccination such as we have in Manchester. It shows that if we had efficient infant vaccination, and a general revaccination from the age of 15 to 25, we need have nothing to fear from smallpox.

At present this information is only of value to the individual, and there is in most towns in England all the elements needed for a great outbreak, with a little bad fortune.

The directions in which we may hope to control events are these :—

1. The provision of isolation at some distance from a large number of houses. On this point the Local Government Board have prescribed definite details.

2. The better instruction of medical students.

3. A vigilant and efficient sanitary staff.

4. Some real control over the movements of the class who live in cheap lodging-houses.

It would seem that the presence of an epidemic alone can effectually inculcate the facts of vaccination.

DIARRHŒA.

The following tables supply the means of estimating the mortality from diarrhœa in 1895, as compared with that occurring in other parts of th country, and give particulars as to the third quarter of the year, when it wa most prevalent. It will be seen that the death-rate was the highest on recor with the exception of that reached in 1893. The mean atmospheric temperature for the same period was also the highest, with the exception o that in 1893, which was the same, and excepting also that in 1884, which wa one degree higher. In that year, however, with a low rainfall and humidity of atmosphere, the mortality was considerably lower than it was either in 1893 or 1895.

DIARRHŒA MORTALITY.—ANNUAL RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
England and Wales	0·61	0·47	0·48	0·96	0·35	**0·57**	0·88
33 Great Towns	0·82	0·65	0·70	1·23	0·50	**0·78**	1·19
London	0·61	0·59	0·60	0·80	0·41	**0·60**	0·82
City of Manchester	1·19	0·81	0·79	1·75	0·70	**1·05**	1·66
Manchester Township	...	1·08	1·08	2·22	1·11	**1·37**	2·20
North Manchester	...	0·70	0·68	1·49	0·52	**0·85**	1·38
South Manchester	...	0·69	0·67	1·59	0·54	**0·87**	1·50
50 Smaller Towns	0·64	0·53	...	...	...	**0·59**	...
67 Smaller Towns	...	...	0·57	1·24	0·41	**0·74**	1·13
Rural Districts	0·41	0·32	0·32	0·72	0·24	**0·40**	0·64

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent:—

Third Quarter of the years	Mean Temperature	Rainfall	Humidity, per cent.	Diarrhœa Mortality. Annual Rate per 1,000 living
1883	58°·1	11·0	77 %	2·26
1884	61°·4	3·6	71 %	4·00
1885	56°·8	7·3	73 %	1·56
1886	59°·1	11·4	75 %	3·42
1887	59°·0	7·7	73 %	3·38
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
Mean	**58°·3**	**9·6**	**75 %**	**2·45**
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55
1895	60°·4	11·2	77%	4·17

The seasonal distribution of diarrhœal mortality is shown by these figures:—

	1891	1892	1893	1894	1895
First Quarter	45	32	48	47	51
Second Quarter	64	36	131	55	59
Third Quarter............	217	275	688	212	574
Fourth Quarter	106	75	89	61	220
	432	428	956	375	904

I have made an effort to deduce from the inquiries of the inspectors into the incidence of diarrhœa in 1895, and from a partial inquiry into infant feeding, some idea of what were the outstanding relations of diarrhœa in Manchester. The results arrived at were that there was a considerable concurrence of fouling of the ground and other insanitary conditions with diarrhœa, by no means, however, so great as occurs in the case of scarlet fever, and that the relation to infant feeding was intimate and unmistakable. As regards the relation of diarrhœa to fouling of the soil, the present condition of the privies throughout the City is such that no conclusion can be definitely drawn, even from a high degree of pollution of the soil occurring in any disease, and it is only when it passes what one conceives credible, as I had imagined was the case in scarlet fever, that any connection can be reasonably believed to exist.

As regards infant feeding it may be said that, with rare exceptions, breast fed children do not die of the condition known as summer diarrhœa, and that diarrhœa, fatal as it is, is therefore a preventable disease.

In the investigation which I have mentioned there were many sources of dissatisfaction and many of fallacy.

At every point there was felt the need of trained medical assistance.

To the other sources of fallacy I must now add one more. In several recent instances, where the inspectors have reported that the child who died from diarrhœa has been fed only on the breast, I have found on visiting the house where the death occurred that the infant had not had diarrhœa at all. The information given me on this point has been spontaneous and distinct, such as: "My child had no diarrhœa whatever: the motions were not loose at all."

As this source of error extends over the whole of the cases, it is necessary to weigh well all the fallacies before committing oneself to any conclusion.

Still, there can be no doubt that the infection of summer diarrhœa is generally communicated by the food, and we cannot therefore take too much trouble to instruct people in the precautions required in feeding infants.

An inquiry made for me into the feeding of infants, and my own observations on the condition of the milk sold in the City, leave no doubt in my mind that much of the terrible waste of young life is due to the food which they receive, and that a considerable amount of the mischief is done by the milk, which leaves the cowshed in a dirty condition, and continues to deteriorate till it is consumed. It is probable that, even when the milk has been boiled, it is again infected from the long tube in general use with the feeding bottle.

1895.—DEATHS AND DEATH RATES FROM DIARRHŒA IN THE VARIOUS DIVISIONS OF THE CITY.

	STATISTICAL DIVISIONS	Estimated Populations	Deaths	Death Rates
	City of Manchester	‡ 527,010	875	1·66
I.	Manchester Township	146,674	322	2·20
II.	Northern Districts	136,166	188	1·38
III.	Southern Districts	244,170	365	1·50
	(TOWNSHIPS)			
I.	Ancoats	46,242	119	2·57
	Central	36,957	70	1·89
	St. George's	63,475	133	2·10
II.	Cheetham	30,310	40	1·32
	Crumpsall	8,873	7	0·79
	Blackley	7,753	3	0·39
	Harpurhey	10,679	14	1·31
	Moston	6,102	...	...
	Newton Heath	36,138	43	1·19
	Bradford	22,030	53	2·41
	Beswick	10,417	17	1·63
	Clayton	3,864	11	2·85
III.	Ardwick	36,779	48	1·31
	Openshaw	28,603	51	1·78
	West Gorton	26,793	69	2·58
	Rusholme and Kirk	18,832	22	1·17
	Chorlton-on-Medlock	61,023	58	0·95
	Hulme	72,140	117	1·62

But the whole subject requires farther investigation, although I doubt whether the inquiry will be possible for me without skilled medical assistance.

As regards the connection between diarrhœa and fouling of the ground, so prevalent is the condition of foul ground from the midden privies and defective pails in the City that the ordinary modes of inquiry are likely to be of little value to us in arriving at useful conclusions from any observations which I might be able to get made. There can be no doubt whatever that such a connection exists, and it is, therefore, of interest to ascertain in what districts diarrhœa exacts the heaviest death toll.

This we learn from the table on page 69 which shows that outside the Manchester Township, and omitting Clayton, the population of which is too small for stable results, the highest mortality is found in the districts of Bradford and West Gorton, which we have already seen to be in an exceptionally bad condition in respect of their privies.

On the Curves of Scarlet Fever, Enteric Fever, and Diarrhœa.

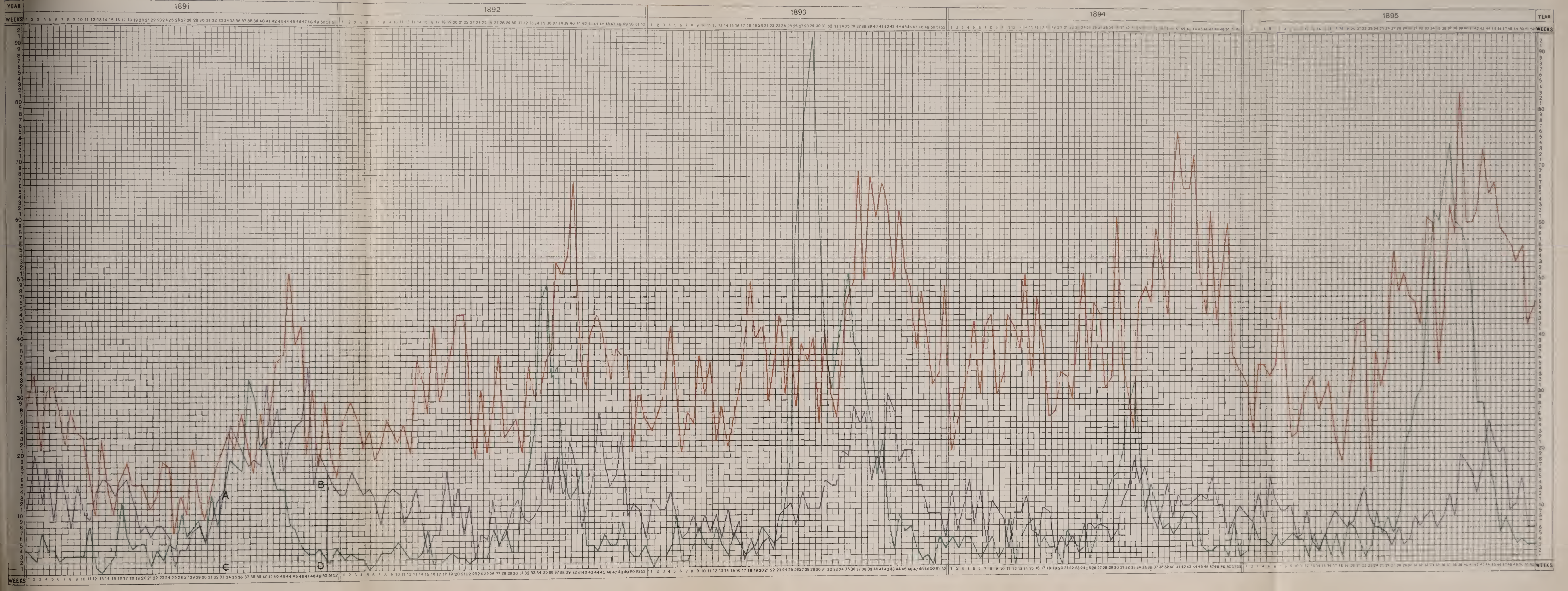
The number of cases of scarlet fever, enteric fever, and diarrhœa in each week are shown in these curves for the last five years. We perceive that there is an autumnal rise in each year in each of the three diseases. The wave of enteric commences definitely to rise from the 20th to the 30th week, and extends over nearly the whole year. The wave of scarlet fever commences to rise from the 30th to the 35th week, shoots up much more decidedly than that of enteric, reaches its apex sooner, and is over about the new year. The wave of deaths from diarrhœa shoots up into a peak, and descends in the same manner. It is earlier than the other two waves.

The waves of enteric fever are marked by numerous zig-zags, as are those of scarlet fever. Were any one cause responsible for the course taken by the curves this would probably be much less the case. The temperature of the ground, as is well-known, is now intimately associated with the number of deaths from summer diarrhœa. But even into that curve partial irregularities are liable to be introduced through heavy rains, cold winds, and so forth.

The suggestion which these curves undoubtedly make is that there is some influence favoured by rise of temperature for each. Further, it is difficult to see what influence this can be other than a growth in the soil of the micro-organisms proper to the respective diseases, whose growth increases as the temperature of the ground rises, but according to a law different for each disease. It is of course a possible, but not the probable explanation, that the body itself is so altered by the rise in atmospheric temperature as to make it at certain times more amenable to infection than at other times. When,

CITY OF MANCHESTER.

CHART SHOWING.—WEEKLY ATTACKS—SCARLET FEVER, ORANGE LINE —— WEEKLY ATTACKS—ENTERIC FEVER, VIOLET LINE —— WEEKLY DEATHS—DIARRHŒA, GREEN LINE ——



however, we consider the period of the year at which this more favourable condition of the body would have to be present, when the frame has just been renovated by spring, this suggestion appears a most unlikely one.

We shall see under "enteric" that that disease unquestionably has some relation to the condition of the closet, probably by the growth therein and in the adjoining soil of infective material. There is a high degree of probability that summer diarrhœa is occasioned by the growth in the soil of specific micro-organisms, a probability which was put forward by Dr. Ballard in explanation of the course of the disease. The suggestion is that, in autumn, the specific micro-organism of scarlet fever probably takes on rapid growth in the ground, and that this growth is an important factor in the causation of the fever. In that case the connection of scarlet fever with fouling of the ground would be intelligible.

It may be mentioned that the number of cases occurring over any period during the five years may be readily measured by the eye. Thus, take two points in the enteric fever curve A and B. The number of cases occurring in the 18 weeks commencing with the 33rd is represented roughly by the area of the space enclosed between the curve, the vertical lines A C, B D, and the base C D. The same applies to the scarlet fever curve; and, as regards deaths, to the summer diarrhœa curve. It will be seen that both the lower portion and the apex of the curve of scarlet fever gradually ascend from 1891, showing for 1895 a certain amount of hesitation in the upward trend. We are probably nearly at the apex of one of those smaller periodic waves of scarlet fever which Dr. Ransome described, and may hope that the number of cases will soon commence to decrease.

In the Metropolitan Asylums Board Report for 1895 a similar curve is given for monthly admissions of cases, and the curve of scarlet fever is there precisely similar, in all respects, to that for Manchester. So also is the curve of enteric fever. The agents which underlie the autumnal wave of scarlet fever are, doubtless, general in their action.

MEASLES.

The accompanying table shows that the mean mortality in Manchester from measles in the years 1890–94 was 0·59, as against 0·59 for the 33 large towns; while in 1895 it was 0·96, as against 0·53 in the same towns. This is a disease which may be expected to be more fatal in large and populous towns than in smaller centres of population.

MEASLES MORTALITY.—ANNUAL RATE PER 1,000 LIVING.

	1890	1891	1892	1893	1894	Mean	1895
England and Wales	0·44	0·44	0·46	0·37	0·39	**0·42**	0·37
33 Great Towns	0·67	0·52	0·69	0·44	0·63	**0·59**	0·53
London	0·77	0·43	0·80	0·38	0·76	**0·63**	0·60
City of Manchester...	0·83	0·43	0·72	0·57	0·42	**0·59**	0·96
Manchester Township ...	...	0·68	1·32	0·86	0·26	**0·78**	0·94
North Manchester	...	0·44	0·44	0·63	0·30	**0·45**	0·70
South Manchester	...	0·27	0·49	0·35	0·60	**0·43**	1·11
50 Smaller Towns	0·35	0·62	...	...	...	**0·49**	...
67 Smaller Towns	...	...	0·40	0·51	0·31	**0·41**	0·38
Rural Districts	0·31	0·33	0·30	0·27	0·24	**0·29**	0·26

The death-rate from measles in 1895 reached the high figure of 0·96 per 1,000 living. Nor does this, by any means, complete the tale of suffering which it inflicts, since many die from chest affections contracted in the course of the complaint, and many also are assailed subsequently by tuberculosis, the result of the injury to the lung which the disease entails. The direct death-rate is but a little behind that in the neighbouring borough of Salford, and promises in 1896 to be higher. The distribution of deaths throughout the year is somewhat remarkable. The numbers are in the

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
94	144	126	141

When measles assails a limited area, its habit is far from being that represented above. Usually the numbers of cases, and of deaths, ascend rapidly, and as rapidly descend. Such, however, is not the course which it has pursued in Manchester last year. The explanation is forthcoming when we examine the figures for the different divisions.

The deaths were in these :—

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Manchester Township ...	59	30	30	19
North Manchester	15	52	21	7
South Manchester	20	62	75	115

It is manifest that in the Manchester Township a descending wave is coincident with an ascending wave in South Manchester, and that the North Manchester wave is intermediate between the two.

Measles is pre-eminently a school disease. Once it has established a footing amid a number of the youngest scholars it sweeps rapidly through them, and it is very difficult to arrest its course in the class. It is also largely spread outside the school by reason of the small attention paid to isolation, or, rather, by the recklessness exhibited in exposing children to infection. These two influences in the propagation of the disease act simultaneously and powerfully. But it is generally possible to make out the influence of particular schools in radiating infection.

In 1884 I was requested to present a report on the advisability of having measles notified; and on the facts which I could ascertain as to the advantages to be derived from this proceeding, it appeared to me that it would be better not to adopt notification of that disease. An alternative policy was, however, put forward, which implied the assistance of the School Board officers, and which aimed at conveying instruction on the isolation and treatment of the disease in all instances in which the cases had a known relation to schools.

The course of procedure is as follows : When any cases of measles occur in a school, the school attendance officers instruct the parents of the children attacked to keep the other school children away from school for a month, or longer, if subsequent attacks occur in the household. They also hand to the parents a printed paper of instructions, telling them how to isolate and otherwise tend the children attacked, and also informing them of their duties in regard to other children, as well as how to disinfect after the attack is over. On the occurrence of a death from measles the Sanitary Inspector visits the house and gives instructions to the parents. In this way any want of information in regard to particular schools is ascertained, though unfortunately at a late period. When the disease appears to be spreading in a school the School Board should at the earliest possible date inform the Medical Officer of Health, so that preventive measures may be adopted. If these reports are delayed till the disease has swept over the school, he has no option but either to close the school or to leave the disease to pursue its course. The same procedure is adopted in regard to whooping cough

This policy has been, I believe, fairly well carried out, and I have to express my obligation to Mr. Wyatt (the Clerk to the School Board) for endeavouring to make this attempt to mitigate the severity of the disease effective. It is, I should think, beyond doubt that a steady course of instruction of teachers and parents must have a considerable and an increasing value. The good effected, however, rests entirely on voluntary action, and unless the advantage obtained by such action is manifest, it will have a considerable tendency to be omitted. It cannot be said that all the benefit possible from this course of action has been reached.

In many cases I have not been made aware of the existence of measles at a school until the disease had obtained formidable dimensions, when vigorous ordinary measures could be of no avail.

I had, then, to leave matters to take their course, or to close the school for a period. Now experience elsewhere has shown that this proceeding, in the case of measles, has been productive of decided benefit. Nor, if we consider the manner in which children are crowded together in classes, is the reason far to seek. Moreover, the inconvenience to parents from having to take their children away from school is a powerful educational influence in regard to the importance of attending to measles. When we have closed schools, it has been my custom, for a considerable period, to send round to all neighbouring schools a request that no child should be admitted from the school which has been closed.

Latterly, also, a request has been sent to the managers of Sunday Schools in the neighbourhood of a school which has been closed to close them during the corresponding period, a request which has been complied with. This policy was pursued in 1895 for the Hulme district, when the disease was spreading rapidly.

It is a matter of some importance to inquire whether the want of coincidence in the waves of measles in different divisions of the City during 1895 has existed in other years.

The rates in the table exhibit not only the severity of the recent epidemic, but also the difference between former years and 1895 in this regard. It appears that in previous years, during which a record exists, the waves are much more nearly coincident in their course. Such want of coincidence as exists might be taken as indicating the period required for the disease to pass from one district to another were it not for the extent over which Manchester and Salford are coterminous, and the influence which one must necessarily exert on the other.

During 1895 the following schools, or part of them, were closed, generally for a period of three weeks :—

Dob Lane British Schools	Newton Heath
St. Saviour's Church of England Schools	Chorlton-upon-Medlock
St. Stephen's Church of England Schools	Chorlton-upon-Medlock
St. Andrew's Church of England Schools	Central
St. Chrysostom's Church of England Schools	Chorlton-upon-Medlock
St. George's Church of England Schools	Hulme
St. Barnabas' Church of England Schools	Openshaw
St. Philip's Church of England Schools	Hulme
Grosvenor Square Board School	Chorlton-upon-Medlock
Lloyd Street Board School	Hulme
Openshaw Wesleyan Schools	Openshaw
Christ Church Church of England Schools	Bradford
Queen Street Board Schools	Bradford
St. Cross' Church of England Schools	Clayton

This proceeding was adopted when the number of cases away, owing to measles, exceeded 10 per cent. of the average attendance. Usually the proportion was much higher.

It is necessary that we should ask ourselves what evidence there was of any benefit derived from this proceeding. This would be a difficult question to answer if we were merely to rely on favourable results. It might be properly contended that such favourable results were merely the normal course of events, of which the closing was but an incident. In several instances, however, in which the improvement following closing was most manifest, the disease resumed its course after a period of cessation, showing, at one and the same time, in those cases, the benefit which had been derived from closing, and the uncertainty of its continuance. One of the advantages obtained in closing schools is that the schoolrooms have a rest, and are for a period exposed to the influence of fresh air. In other words, a natural process of disinfection is added to the artificial one, which is carried out at the expense of the sanitary authority. Besides the cleansing and purifying process which the schools undergo, and which is certain to add to the salubrity of the schoolrooms or to detract from their detrimental influence, the drainage, closet arrangements, ventilation, &c., of the school are reported upon, and the report is forwarded to the managers. In this way improvements have been effected in a number of the schools.

In consequence of the applications to the Education Department for grants by reason of the absence of scholars from measles, &c., and the necessity for a certificate from the Medical Officer of Health, testifying to the absence of scholars from that cause, it has become necessary to do a considerable amount of additional work in the Health Department. This we willingly undertake, if, in return, we are to be apprised of the occurrence of measles in a school at an early period, so that an effort may be made to stay its progress. So far we have, usually, not received this early intimation of the disease, which is the more regrettable, inasmuch as this is the information which would most enable us to be useful both to the parents and to the school.

How far the closing of schools has coincided with the prevalence of measles may be seen from the following table of district populations and deaths, it being remembered that the proceeding only began to be adopted in July of 1895, and that the Central divisions would, therefore, be comparatively little affected by it.

Statistical Areas		Estimated Population to middle of 1895	No. of Deaths
City of Manchester ……		**527,010**	**505**
I.	Manchester Township …	146,674	138
II.	North Manchester………	136,166	95
III.	South Manchester………	244,170	272
	TOWNSHIPS		
I.	Ancoats …………………	46,242	31
	Central …………………	36,957	41
	St. George's …………	63,475	66
II.	Cheetham ………………	30,310	4
	Crumpsall ………………	8,873	1
	Blackley…………………	7,753	1
	Harpurhey ………………	10,679	8
	Moston …………………	6,102	3
	Newton Heath …………	36,138	50
	Bradford ………………	22,030	15
	Beswick…………………	10,417	13
	Clayton …………………	3,864	…
III.	Ardwick ………………	36,779	66
	Openshaw ………………	28,603	29
	Gorton (West) …………	26,793	14
	Rusholme and Kirk…….	18,832	5
	Chorlton-upon-Medlock..	61,023	77
	Hulme …………………	72,140	81

In conclusion, so far as I can judge, the measures which have been carried out on the lines sketched in the Annual Report for 1894 (page 31) have been useful, but might be rendered very much more so if we received early intimation of the occurrence of measles in a school. They have not been able, evidently, to alter very much the course of the epidemic, but they are calculated to be beneficial in detail.

WHOOPING COUGH.

The figures giving the whooping cough mortality for 1895 are as follows:—

Whooping Cough Mortality.—Annual Rate per 1,000 living.

	1890	1891	1892	1893	1894	Mean	1895
England and Wales	0·48	0·47	0·46	0·34	0·39	**0·43**	0·30
33 Great Towns	0·62	0·64	0·57	0·48	0·48	**0·56**	0·37
London	0·77	0·68	0·59	0·54	0·48	**0·61**	0·34
City of Manchester...	0·37	1·02	0·72	0·46	0·55	**0·62**	0·47
Manchester Township ...	...	1·24	0·86	0·64	0·55	**0·82**	0·72
North Manchester	...	0·72	0·60	0·28	0·45	**0·51**	0·37
South Manchester	...	1·04	0·69	0·45	0·60	**0·70**	0·38
50 Smaller Towns.........	0·44	0·39	...	...	...	**0·42**	...
67 Smaller Towns.........	...	...	0·49	0·31	0·39	**0·40**	0·32
Rural Districts	0·36	0·35	0·32	0·23	0·33	**0·32**	0·25

The same procedure is adopted for whooping cough as for measles, and the above remarks are in the main applicable. The death-rate in 1895 was low for Manchester, but exceeded the average of the 33 great towns in 1895 by more than it did in 1894. As usual, the death-rate was much the highest in the Manchester Township. As was mentioned in the previous Report, the mortality from whooping cough has an intimate association with insanitary conditions such as are so prevalent in the Manchester Township, and so fatal to infant life in general. North Manchester, again, presents the lowest fatality from this cause. The rates in the above-mentioned table allow a comparison to be made between different parts of the City, and also between Manchester and other parts of the country in respect of this disease.

The following figures show that whooping cough was more prevalent in the first half of the year :—

1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
79	99	33	39

The deaths in districts are as follows :—

Statistical Areas	No. of Deaths
City of Manchester	**250**
I. Manchester Township	105
II. North Manchester	51
III. South Manchester	94
Ancoats..................................	19
Central	12
St. George's	74
Cheetham................................	5
Crumpsall................................	5
Blackley	4
Harpurhey	7
Moston	3
Newton	14
Bradford	9
Beswick	4
Clayton..................................	...
Ardwick	18
Openshaw..............................	8
West Gorton............................	6
Rusholme................................	3
Chorlton-upon-Medlock	6
Hulme	53

ON THE MEASURES WHICH MAY BE TAKEN FOR THE PREVENTION OF TUBERCULOSIS IN MAN, WITH SPECIAL REFERENCE TO NOTIFICATION.— A preliminary statement.

As a result of the knowledge which has accumulated during the last 30 years, no well-informed man now doubts that tuberculosis (including the special forms phthisis, consumption of the bowels or tabes mesenterica, tubercular meningitis, caries, scrofulous glands, &c.) is an infectious disease.

The infective element can be grown outside the body, and transferred from one artificial soil to another an indefinite number of times. The last growth obtained in this manner is, apparently, as infective as the first, and when inoculated in guinea-pigs, rabbits, &c., rapidly lights up in them the disease.

Since the publication, in 1882, by Koch of his discovery that tuberculosis is invariably produced by a distinct bacillus (a small plant shaped like a rod), its properties have been thoroughly investigated, and are now better known than those of any other infective micro-organism with which we have commonly to deal.

In coming to a conclusion as to the precautions which we must take to prevent the continued propagation of the disease, it is necessary, therefore, to know something about this micro-organism, which is found wherever active tuberculous disease is present, and which has been conclusively proved to be the *vera causa* of consumption.

The points relating to the infective element in tuberculosis, which are of importance for practical purposes, may be thus briefly stated :—

Extract from the "Journal of Public Health."

(Vol. V., page 196.)

On the Prevention of Phthisis.

1. The bacillus of tubercle forms within the body highly resistant spores, capable, when discharged from the body in sputum or otherwise, of prolonged vitality in a dry state.

2. The sputum in advanced cases of phthisis frequently swarms with bacilli and their spores. In the course of their experiments on the disinfec. tion of sputum, Schill and Fischer found that such dried sputum, even after 140 days, was able, when inoculated in guinea-pigs, to light up tuberculosis- The bacilli cannot well escape from moist sputum, or from undisturbed dried sputum. It is only when the dried sputum is ground into dust, or carried about by fibres of cotton, &c., that it is in a position to reproduce the disease by inhalation.

3. Putrefaction does not materially impair the infectiveness of tuberculous material, which is also very resistant to the influence of heat and cold.

4. Koch showed, by inhalation experiments with pure cultures of tubercle bacilli, that the disease could be readily communicated by the air passages.

5. The identity of the disease in man, the monkey, the ox, the horse, the pig, &c., was shown by the identical character of the pure cultures derived from tubercle in each of them, and also by the fact that pure cultures from tubercle in man, no matter how many generations of culture it might have

passed through, when inoculated in the animals mentioned produced tuberculosis. It may be mentioned that there is some clinical proof, by accidental inoculation of the identity of human and bovine tuberculosis. The guinea-pig reacts in the same manner to tubercular matters or cultures obtained from the animals mentioned.

6. It was at first thought that the tuberculosis of birds was identical with that in mammals. This view was based on the identity of staining characters, and in appearance, of the bacilli proper to each. It has been found, however, by various investigators that avian tuberculosis is not directly communicated to the guinea-pig, nor can mammalian tuberculosis be communicated by inoculation in birds. The cultures flourish best at different temperatures, and those of avian tuberculosis are more florid and elevated than those from mammalian tubercle. Koch in his last pronouncement, which I have seen, regarded them as distinct though closely allied varieties.

7. Human and bovine tubercle bacilli grow on blood serum or glycerinised agar-agar at temperatures ranging from 82° F. to 104° F. They are very particular as to soil, and they do not grow outside the temperatures mentioned. We must, therefore, assume that in these latitudes they do not grow at all except in the body of animals, and that the infective material is always less than that being discharged from such bodies.

8. Such discharge is mostly in the form of sputum. We may consider that at least nine-tenths of the infections occurring between man and man are by the medium of phthisical sputum. What a magnificent opportunity for preventive medicine, which can concentrate most of its attention on securing the harmlessness of what consumptives spit up.

9. Koch established, on an immovable basis, the tuberculous nature of lupus, of certain forms of disease in bones and joints, and of scrofulous glands and sores.

10. Schill and Fischer, in an elaborate series of experiments on the disinfection of sputum, and therefore of materials soiled therewith, found that the best chemical agent was carbolic acid in quantity, at least equal to the quantity of sputum, and acting for a prolonged period. For disinfection of clothes, bed-clothes, carpets, &c., steam at high pressure is most suitable, but on bulky articles should act for an hour. For articles not in bulk half-an-hour suffices.

11. The most important contributions, however, to the etiology of tuberculosis, since Koch's discovery, have been made by Dr. Georg Cornet in his investigations into the dissemination of the tubercle bacilli outside the body; into the mortality of Catholic nurses in Germany; and into the prison-relations of tuberculosis. The two first-mentioned researches are reprinted in book-form and are models—one of statistical reasoning, the other of careful experimental work. It is impossible to do more in the space at my disposal

than give a glance at these works. Starting with the evident fact that if the infective material discharged by tuberculous patients, and that in overwhelming preponderance in sputum, is really the medium by which fresh cases are infected, such material must be discoverable outside the body in an active condition, he proposed to himself the task of investigating whether such infection is actually present in the neighbourhood of consumptives in an active form, diffused as dust, which on stirring can get into the air and cause infection; if so, under what circumstances such infection is most abundant; also whether in indifferent places, such as public streets where consumptives spit, enough infection is present to cause fresh disease? Manifestly, if such infection is everywhere, the task of prevention would be enormously increased, if not impossible. To all these questions he was able to give an answer. The dust was removed from one to two square metres of wall or ledge (each square metre being calculated to represent the deposit from 51,000 litres of air), mixed with bouillon, and injected into the abdominal cavity of guinea-pigs.

The places selected for the removal of dust were such as could not have been directly contaminated by sputum, and, therefore, necessarily represented deposit of dust from the air, derived ultimately, of course, from dried tuberculous discharges. Each admixture with bouillon was used to inoculate three guinea-pigs, since some were certain to die of other diseases besides tuberculosis.

The result of these experiments is exhibited at page 87 of Cornet's work on tuberculosis. Seven hospitals, containing 21 wards with phthisical patients, were examined by insertion of the dust into 94 guinea-pigs; of these 52 died of other diseases, and in 15 instances at least one guinea-pig became tuberculous, representing 15 wards in five hospitals. Three lunatic asylums were examined, experiments being made on 33 animals, of which 16 died of other diseases than tuberculosis. In three instances one guinea-pig became tuberculous. Two prisons gave negative results, as did a chamber used for inhalation experiments with tuberculous materials. From the rooms of tuberculous patients treated at home, tests were applied to 170 guinea-pigs, of which 91 died of other diseases, and in 21 instances at least one guinea-pig became tuberculous. The injected material failed to produce tuberculosis when taken from a policlinic, from near a lupus patient, from an orphanage, from the Pathological Institution, from surgical wards, and from streets.

The results of these experiments in a policlinic is somewhat surprising, and affords unmixed gratification in the case of streets.

The results of the test applied to phthisical wards is somewhat disconcerting, inasmuch as one would suppose that all danger would there be avoided, but Cornet was able to satisfy himself that the necessary care was not always observed.

But the most important fact noted in these experiments was that where the sputum had been carefully collected or destroyed, and not allowed to contaminate the room, there the tests failed to produce tuberculosis. Moreover, these experiments conclusively do away with the idea that the infection of tuberculosis is everywhere present in amount sufficient to set up the disease.

It should be added that repeated microscopic examinations of the infective dust failed to reveal any bacilli, so that the infective matter in such dried sputum exists chiefly as spores.

As regards the mortality from tuberculosis of Catholic nurses, who were selected because of permanent attachment to their institutions, it was—especially in the earlier years of their duties—enormous; the apex of incidence of death-rate falling between the second and third years from the commencement of work. This period has been arrived at from other sources as the most usual between infection and death. It was the period which my inquiry—in 1886—into deaths from tuberculosis pointed out as most usual. Cornet indicates the cause of this early and sustained mortality, The novitiates and young nurses have to dust the floors, shake the beds, and so forth, tasks which Dr. Cornet had previously shown to expose them peculiarly to infection.

Nevertheless, it is to the experimental evidence that we owe the overwhelming proof that tuberculosis is infectious. To clinical evidence is assigned the humbler task of assisting experiment in showing in what manner and where infection is conveyed. The extent to which such infection seems probable varies greatly with the observer. One whose attention has not been specially fixed on this point will often have seen no instance of infection. An inquirer at a clinic will find 7 per cent. If, however, one patiently fishes out the doings of consumptives during the last few years, it may be possible, in a majority of cases, to prove exposure to infection, probably repeated or prolonged. Such, at all events, was my impression from the last 102 deaths I inquired into.

The above summary has to be supplemented by two observations.

1st. As regards the growth of the bacillus of tubercle outside the body, it was shown by Sir H. Beevor that the bacillus can be got to grow at a temperature as low as 60° F. on certain glycerinised soils, and it is inferred that it may possibly grow on damp walls, &c. It is impossible to deny the possibility of this occurrence, as to which, however, there is no positive evidence.

2nd. The bacillus is rapidly destroyed by exposure to the combined action of light and air. This we know from the observations of Koch, and more recently of Delépine and Ransome.

Now it is not sufficient to know that the bacillus always precedes and causes tuberculosis. In order to shape our course practically we require to be familiar with the circumstances under which the infection is operative. From inquiry into the history of individual cases one is able to formulate the following conclusions.

Healthy individuals do not contract consumption except when exposed to prolonged and intimate contact with consumptives or with infective dust, which last may happen on the occupation of a room recently inhabited by a consumptive person. Under prolonged exposure, however, the strongest may succumb.

As a rule, to contract consumption there is required the combination of a weak frame and prolonged exposure to infection.

The disease may, however, be contracted from a comparatively slight degree of exposure to infection when the body is injured by excess, privation, distress, or previous disease. Amongst the diseases which lead to consumption may be mentioned measles, whooping cough, and pneumonia.

Any continued catarrh of the air passages is dangerous, as is also, especially in children, any unhealthy condition of the bowel.

Then, again, damp, badly ventilated, or dark dwellings are powerful factors in the production of consumption, as is also overcrowding.

Certain occupations connected with a stooping and constrained posture, or entailing the inhalation of sharp dust, powerfully predispose to the disease, no doubt by rendering the air passages accessible to attack.

The poor suffer much more than the well-to-do.

The progress of the disease is slow, and, as the observations of Dr. Thomas Harris have proved, it is frequently entirely arrested.

From all these facts we infer that a struggle takes place between the tissues of the body and the infecting element when it is introduced into the system. A healthy frame repels one or several assaults. Each assault, however, has endangered the part attacked somewhat, so that infective assault coming after infective assault in frequent succession may result in the part assailed ultimately succumbing. If the body has been much weakened, the amount of resistance may be only slight. This weakening of the frame may be brought about by initial feebleness of constitution, by insanitary surroundings, by excess, by distress, by disease, or by a combination of such factors.

These conclusions are suggested or confirmed, it does not matter which, by what we observe in those parts of the body which have been attacked by the disease.

No one who has the welfare of his fellow-men at heart would hesitate to advocate any reasonable course of policy which would be likely to lead to the diminution of this terrible plague, but there is, certainly, a difference of opinion as to the course which ought to be adopted.

On one hand we are told that what we ought to do is to remove the powerful determining factors which render the infectious matter of tuberculous so deadly to our poorer people.

What you ought to do, it is said, is to clear out your slums, sweep away all insanitary areas, and rebuild healthy dwellings on the sites, providing abundance of light and fresh air.

It is to be feared that if we are to wait till this policy has been carried out in Manchester in a manner to satisfy the advocates of the application of general hygienic improvements to the removal of phthisis, we shall be disappointed and disheartened. How, for instance, are we to secure the absence of damp from houses which, until recently, were generally built without any damp-proof course.

I do not question that the policy indicated will diminish the incidence of tuberculosis.

What I would place before you is the recent great extension of our knowledge in regard to the disease, and the desirability of at once utilising this knowledge.

The first thing to be done is to add tuberculosis to the list of notifiable diseases, a course advocated by Dr. Arthur Ransome in his recent work on the treatment of phthisis.

Resolutions in favour of this course have been recently passed in the Public Health Section of the British Medical Association, and at the Congress of the Sanitary Institute at Newcastle.

There are some minor difficulties connected with this proposal which, however, I would leave to be worked out by a practical experience of notification.

This course could be adopted for a limited period, and, if found unworkable, abandoned. Defeat in this matter would be more honourable than inaction.

The class of cases which ought to be notified embraces all those who suffer from tuberculous discharge.

It ought, however, to be distinctly stated that in carrying out inquiries and measures in connection with the notification of tuberculosis, the Medical Officer of Health would be much hampered without he were able to avail himself of medical assistance. The objects to be aimed at in the notification of tuberculosis may be thus stated :—

1. An opportunity will be afforded for closer investigation into the history of individual cases, and into the various circumstances of work, habitat, daily life, infection, &c., under which the attack has arisen. It is desirable that the various conditions attaching to the lives of those who have become affected should be brought together, and not artificially separated. It is, I think, possible to draw utterly fallacious conclusions as to the effect of particular causes from want of this knowledge.

2. It is especially desirable that the sanitary conditions of the home should be noted. It has been over and over again asserted that the conditions under which the consumptive person lives form the most important factor in producing his illness, and in preventing his recovery. It is, therefore, of the very utmost importance, both for the sake of the consumptive individual and for the sake of those living with him, that these insanitary conditions should be ascertained as speedily as possible and removed.

3. General printed instructions would be given to the relatives which would guide them as to the measures required to prevent the invalid from proving a source of infection to others as well as to himself, whether at home or at the workshop.

Doubtless the medical attendant will, more and more, attend to the personal means of prevention, but it is desirable that his advice should be sought as well as offered, and that it should, in all cases, be systematically afforded. In this manner, and with sufficient constancy of work, a great improvement may be effected.

4. Measures of disinfection are urgently required in these cases, and particularly in respect of consumption is it true that a knowledge of elementary principles in regard to ventilation and lighting should be conveyed, their supreme importance for the particular case being urged.

The previous conditions deal with the danger of infection arising from previous consumption in man, but, especially in the country, there is a great danger to farm servants arising from working amongst tuberculous cattle in badly lighted and ill-ventilated sheds. Tuberculosis is exceedingly prevalent amongst milch cows, the infective material being doubtless mainly voided with the dung, partly also, however, in the ropy secretion from the mouth and nostrils. This material, drying in the cowshed, infects both farm servants and sound cows. Moreover, phthisical farm servants carry infection to sound cows. These remarks would concern more particularly country districts were it not that tuberculosis is excessively prevalent amongst cows kept in towns.

In addition, however, to the risk of direct infection arising from tuberculous cows, there is great danger of infection to children from the milk which they yield. When the udder of the cow had become affected, the milk was found in experiments conducted by Dr. Martin and Dr. Woodhead for the recent Royal Commission to be virulent in its intensity of infectiveness, a result which served to confirm previous observations.

This must be regarded as the greatest danger arising from tuberculosis in the cow, although feeding experiments with animals have shown that the flesh of such animals is dangerous as food.

I do not intend to enlarge on this subject at present, since the Markets Committee have recently appointed two assistant Veterinary Surgeons, an important part of whose duties will consist in a systematic inspection of our cowsheds.

Since their appointment, now four months ago, five tuberculous cows have been slaughtered with the consent of the cowkeepers.

In doubtful cases of affection of the udder, light may be expected to be thrown on the condition of the cow by a systematic examination of milk from the suspected udder, a proceeding which will be resorted to as occasion arises.

As regards meat, the inspection at the Water Street Abattoir is efficient, and the action taken upon it is in advance of that to be found in most large towns.

The inspection of meat sold in the shops is now more satisfactory—in fact a distinct advance has been made. But there can be no guarantee of the quality of much of the meat until private slaughter-houses are abolished, and until all meat sold in the City has had to undergo skilled inspection before distribution.

Then, again, as regards our milk supply, we await the passing of new regulations, without which we find ourselves unable adequately to deal with the state of the cowsheds. Without such action we cannot hope for a permanent improvement in the milch cows kept in Manchester, so far as tuberculosis is concerned.*

I hope to be in a position next year to give a more complete report on these important topics. At present our arrangements are incomplete.

In conclusion, I would again express my opinion that Manchester should lead the way in having tuberculosis added to the list of notifiable diseases, and in taking direct action to prevent the continued propagation of this scourge.

On our Milk Supply.

In the Report for 1894 a section was devoted to this subject. It was there mentioned that the bulk of our cowsheds were in an insanitary condition, many of them being defective in cubic space and light. The cows, too, are frequently in a surprisingly dirty state.

This condition of things is not confined to Manchester and its neighbourhood. Wherever one goes—in Yorkshire, in Cumberland, in Wales—the same state of things prevails. The milk is drawn with dirty hands from dirty udders. It is often kept in a dairy unfit for the purpose. It undergoes further pollutions before it reaches the consumer, and I should say it was the exception to get milk delivered without a quantity of dirt in it. I am bound to say, however, that I have seen milk in the poorer parts of the City, where one would not have expected it, quite free from deposit. Bacteriologically this deposit is shown to be derived, partly, at all events, from the cow's excrement.

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* These regulations are now approved, and come into force on October 5th, 1896.

In some instances I have felt that the milk should be condemned as unfit for consumption.

Having regard to the existing conditions of administration, it appeared to me last year that the most effectual means of assailing the present state of things was to found a private company on the lines adopted at Copenhagen, which was brought to my notice by Sir Bosdin T. Leech, who was able to speak of the matter from personal experience.

The President of the Manchester Medical Society (Dr. Ashby) has strongly advocated this policy, and would conjoin with a milk factory, on those lines, a milk laboratory for the preparation of milk prescriptions, such as have been now at work for a considerable time in some of the principal American cities.

If this were a matter in which the municipality could take a part, I would strongly commend it to your attention. As it is, I look hopefully in this direction for the improvement of our milk supply.

You cannot get sanitary improvements for nothing, and the Company would have to pay more for their milk than the ordinary dairyman, in order to enable the farmer to produce his milk under better circumstances. It would pay him well to do so. The destruction of stock by tuberculosis under existing circumstances must be prodigious, and what does not come to light is at the expense of the consumer. There must, also, be a great loss from degenerative changes in the milk, either in butter and cheese or, if the milk is distributed, in human life.

The schoolmaster is abroad, however, and a great advance will no doubt be made by the next generation of farmers.

The establishment here of such an institution as the Midland Dairy Institute would, doubtless, accelerate the change. A most profitable contribution to agriculture, indeed, at the present time would be to found several such colleges in different parts of the kingdom, with well-equipped laboratories for research attached.

On Bakehouses.

Last year I gave an account of the condition of many of the cellar bakehouses, pointing out the reasons for regarding them as injurious to the bakers, and as likely to lead from time to time to the production of an infected bread. It was mentioned in that account that the Master Bakers' Association had passed a resolution to the effect that it would favourably consider any proposed Act of Parliament that would gradually close all cellar bakehouses throughout the country, providing the reasonable interests of the trade were safeguarded. I also gave an account of the bakehouses dealt with by me up to the time of writing the report for 1894, and the manner of procedure.

A large number of bakehouses have been dealt with since then, and the following course was adopted. If it appeared that no improvement could be made that would render the bakehouse fit for use, no specification was made; the baker was informed that it would be necessary to close the bakehouse.

When it appeared doubtful whether the bakehouse could be sufficiently improved, the baker was referred to a sanitary engineer for a specification. If he expressed the opinion that the bakehouse could not be rendered fit, the baker was, naturally, better satisfied on the point.

If it appeared to me that the bakehouse was clearly susceptible of being made reasonably suitable, I made a specification on the lines given at page 135 of the report for last year.

It may be said that these proceedings are calculated to perpetuate cellar bakehouses. But the baker is given to understand that these alterations are accepted only so long as cellar bakehouses are permitted. It may be mentioned that the cellar bakehouses in Manchester are nearly all without an adjoining area for light and ventilation.

In order to remove the feeling of hardship created by issuing a summons against the baker without preliminary warning, the Town Clerk was requested in all cases to warn the baker that a summons would be taken out unless the requirements of the Medical Officer of Health were complied with.

These arrangements answered fairly well. But, in the first place, instead of the bakers getting the best advice, specifications were sent in to me crudely drawn up, and sometimes hardly intelligible. So far as they were intelligible, they did not fulfil the conditions. Moreover, there was a tendency to hastily patch up the places in an imperfect manner without any specification.

Further, I found, even after a specification had been obtained which fairly satisfied me, that, from imperfect understanding of the objects aimed at, omissions were made which entailed repeated visits, and which seriously impaired the value of the alterations.

With the permission of the City Surveyor, Mr. Lawson, of the Surveyor's Department, was requested some months ago to draw up a specification on certain lines, which were indicated, and a copy of such specification is now furnished in every instance in which a bakehouse has been condemned by me as unfit for use.

The following is a copy of the general form of specification, which is altered to suit individual cases :—

..................189

CORPORATION OF MANCHESTER.

Bakehouses.

Specification of Work required by the Medical Officer of Health to be executed at occupied by on or before the day of 189 .

1. All foul, injurious, and offensive matters are to be removed from the floors, foundations, walls, and all other portions of the premises, and the premises are to be thoroughly cleansed and disinfected. Any new filling material must be of dry and suitable character. Foul Eart &c.

2. (Dealt with as required.) Closets a Ashes.

3. All drains and connections to same are to be entirely removed and disconnected from the bakehouse and rooms in connection therewith. Drainage.

The drainage from the whole of the underground premises to be carried through an external wall by means of a stoneware or cemented channel discharging over an 18 inch channel gulley fixed in a suitable area or open space.

The drains are to be constructed in accordance with the building bye-laws now in force within the City.

No drains are to be covered in until tested and approved by the proper officer of the Corporation.

4. All walls are to be damp proof, and shall be maintained in such condition. Walls.

All projections and irregularities in the existing walls are to be removed, and all hollows and crevices filled or built up with suitable materials.

The joints are to be raked out and the wall hacked over, and then rendered and floated with Portland cement and sand, mixed in the proportions of one part Portland cement to three parts clean, sharp sand, such rendering to be left ¾ inch thick at all points. The wall shall be finished with a coating of Keen's cement ¼ inch thick, worked to a smooth and polished surface.

(New internal walls are specified as follows when the dampness of the premises render same necessary.)

New internal lining walls are to be constructed with white glazed brickwork 4½ inches thick, with flat smooth Portland cement joints not exceeding ⅛ inch thick.

The new walls shall be constructed at a distance of two inches from the existing walls, bonded to same by means of suitable vitrified bonding bricks or by cast-iron cramps.

The cavity thus formed to be ventilated by air bricks or other suitable appliances placed in the outside wall.

All areas, whether for lighting or drainage, are to be constructed with white glazed brick or tile faces.

rs. 5. The floors are to be at least six inches thick over the entire surface and to be composed of Portland cement concrete, mixed in the proportions of one part Portland cement to five parts of broken stone or bricks and one part clean, sharp sand.

The surface to be finished with a ¾-inch layer of Portland cement and granite chippings to pass ¼ inch guage, mixed in equal proportions.

The floors to be formed so as to fall to a channel leading to the outlet gulleys.

ngs. 6. The ceilings are to be relathed, plastered, and skimmed with Keen's cement worked to an even, smooth, and polished surface (where existing ceilings are in good condition, limewashing only is specified).

ting. 7. The whole of the premises are to be efficiently lighted by means of airtight windows placed in external walls, or by means of white glazed brick areas covered with airtight pavement lights of an approved pattern.

Permission to construct areas and pavement lights in streets or passages must be obtained from the Corporation.

Artificial lights are to be arranged in such a manner as will assist the ventilation of the bakehouse as well as to enable any products of combustion to be drawn away.

ilation. 8. Fresh air to be provided by means of air inlets on the "Tobin" tube system of a total sectional area, exclusive of grids or other obstruction, of at least square inches.

The intakes for same are to be fixed at a height of not less than six feet above the level of the adjoining street or passage, in a position free from dust and dirt, and to be protected by grids of a clear ventilating area equal to that of the respective inlet tubes. The inlet tubes to discharge at a height of feet above the level of the bakehouse floor.

The foul air is to be drawn away by means of extract ventilators of a total internal sectional area of square inches, with of bell-mouth inlets to same, arranged in effective positions.

Extract tubes or flue ventilators are required by one or other of the following methods :—

(*a*) To the oven flue by means of an opening equal to the area of such tubes, and fitted accurately, with a mica flap on the flue side of the outlet.

(*b*) To a new flue to be built alongside the existing oven flue.

(*c*) To be carried where possible over the oven, and connected to an outside upright shaft of inches area, terminating above the roof of the premises, and fitted with a suitable cowl.

(*d*) To an outlet grid in an external wall of inches clear area, fixed at least feet above the grids, admitting air to the intake tubes.

All openings to ventilating tubes to be covered with fine gauze wire netting of at least ½-inch square mesh.

All ventilating tubes are to be carried in direct lines and with as few bends as possible. No right angled or acute bends will be allowed.

9. All troughs, tables, bins, &c., are to be provided with strong ball-bearing swivel castors, and arranged so as to be easily moved, and to allow for proper cleaning and inspection. Fittings.

10. Woodwork usually painted to have three coats of good oil paint, including the priming coat. Woodwor

The joints of any shelving or other woodwork, and joints at walls and other places, to be filled up with suitable material, and left smooth, flush, and even.

11. (Specified as required.) Limewash

12. Due notice before the commencement of any of the above works must be given to the Medical Officer of Health. Commenc ment of w

(Signed)

MEDICAL OFFICER OF HEALTH.

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The Inspector of Workshops is instructed to report to me when the work has been completed to specification, and if it appears to me, on inspection, to be satisfactory, the bakehouse is written off the books.

In this way the proceedings are conducted in a systematic manner, with much less trouble than formerly, and with better results.

The amount of work done since the commencement of these proceedings in 1894, as taken from the books, is as follows.

In order not to influence adversely the trade of the baker, the bakehouses closed are indicated only by the address at which they occur. The addresses, however, are supplemented by names where satisfactory structural alterations have been carried out.

CLOSED.

District	Address	Date when reported closed
Ancoats	20, Rodney Street	April 16th, 1895
Do.	72, Tame Street	June 14th, 1895
Do.	112, Tame Street	July 4th, 1895
Do.	344, Oldham Road	June 22nd, 1896
Central	74, Red Bank	August 24th, 1894
Do.	115, Long Millgate	April 9th, 1895
Do.	7, Oxford Street	June 26th, 1896
Do.	237, Deansgate	February 4th, 1896
Do.	79, Miller Street	July 11th, 1896
St. George's	16, Rochdale Road	August 2nd, 1895
Do.	112, Collyhurst Street	August 20th, 1895
Do.	60, Rochdale Road	December 14th, 1895
Do.	180, Rochdale Road	April 10th, 1896
Cheetham	5, Bury New Road	October 26th, 1894
Do.	195, Great Ducie Street	May 3rd, 1895
Do.	36, Cheetham Hill Road	April 8th, 1895
Do.	214, Cheetham Hill Road	May 7th, 1896
Ardwick	57, Chancery Lane	March 9th, 1896
Do.	Ainsworth Street	March 9th, 1896
Newton	1, Ford Street	March 6th, 1896
Hulme	323, Chester Road	February 21st, 1896
Do.	55, George Street	February 29th, 1896
Do.	12, Rutland Street	February 8th, 1896
Do.	29, Medlock Street	September 26th, 1895
Do.	80, Warde Street	September 17th, 1894
Do.	111, Clarendon Street	October, 1895
Do.	93, Upper Medlock Street	January 4th, 1895
Do.	156 Medlock Street	July, 1896

Put in Satisfactory Repair.

Situation	Occupier	Date when reported satisfactory
43, Fernie Street	Bernstein, H.	February 12, 1895
5, Nightingale Street	Lebovitch, M.	June 17, 1895
41, Lord Street	Solomon, M.	March 18, 1895
5, Adeline Street	Glaskie, H.	October 1, 1895
35, Saint Andrews Street	Beaumont, J.	April 28, 1896
108, Conran Street, Harpurhey	Skelly, J.	June 10, 1895
118, Oldham Road, Miles Platting	Ashworth, R.	March 7, 1895
97, Ashton Old Road, Openshaw	Unoccupied	October 28, 1895
5, Bury's Buildings, Queen's Road	Dawson Bros.	May 15, 1896
4, Butler Street, Oldham Road	Wardle, C.	January 23, 1895
263, Ashton Old Road, Ardwick	Morgan, G. H.	April 26, 1895
8, Rosamond Street East	Rogerson, J.	May 15, 1896
111, Gorton Lane	Lord, Elizabeth	March 12, 1896
48, Russell Street, C.-on-M.	Ambery, A.	March 2, 1896
122, Stockport Road	Schulbe, E.	April 20, 1896
77, London Road	Shirley, S.	January 18, 1896
161, Princess Street	Warburton, E.	June 19, 1896
267, Hyde Road	Mottershead, J.	April 27, 1896
89, George Street, Hulme	Beech	February 28, 1896
66, Medlock Street, Hulme	Wardle	January 26, 1896
123, Chester Road, Hulme	Simmons	August 21, 1895
83, Clarendon Street, Hulme	Oldfield	January 22, 1896
115, Great Jackson Street, Hulme	Handforth	April 25, 1896
60, Lloyd Street, Hulme	Lunt	November 8, 1895
82, Deansgate, City	Worrall	May 8, 1895
6, Upper Jackson Street, Hulme	Mytton	April 1, 1895
60, King Street, City	Killer	April 25, 1896
63, Princess Street, City	Maclurkin	January 5, 1895
51–55, Princess Street, City	Matthews	March 19, 1895
1, Ludlow Street, C.-on-M.	Greenwood	December, 1894
2, Hampden Place, Hulme	Williams	November 9, 1894
122, Medlock Street, Hulme	Turner	November 9, 1894
Mytton Street, Hulme	Co-operative Society	January 8, 1895
128, Stretford Road, Hulme	Filden	February 28, 1896
8, Saint Mary's Gate, City	Parker	February 19, 1896
7, Lawson Street, C.-on-M.	Britton	February 26, 1896

It will be manifest that a great amount of really useful work is being carried out. It would no doubt be better if the cellar bakehouses could be altogether closed at once. That, however, is not practicable where the bulk of the baking is done in cellars.

As a result of the action taken by the Sanitary Authority, a few bakehouses are being built on the level.

The list for 1895 is as follows :—

STATEMENT OF THE NUMBER OF NEW BAKEHOUSES AND ALTERATIONS TO EXISTING BAKEHOUSES APPROVED BY THE IMPROVEMENT AND BUILDINGS COMMITTEE DURING THE YEAR 1895.

Situation	Date of Approval	Date of Completion
Bakehouse, 250, Waterloo Road, Cheetham	23rd January, 1895	20th, March, 1895
Shop, House, and Bakehouse, Clarendon Street and Welcomb Street, Hulme	24th April, 1895	24th June, 1896
Bakehouse and Stables, Bridge Street, Chorlton-upon-Medlock	24th April, 1895	Will not be proceeded with
Bakehouse and Stables, Ashton New Road, Clayton	2nd July, 1895 (George Bowers)	December, 1895
Bakehouse, Ashton Old Road and Vine Street, Openshaw	13th June, 1895	November, 1895
Shop and Bakehouse, Ricketts Street, Jones Street, New Moston	26th June, 1895	In course of construction
Shop and Bakehouse, Lotherton Street, Harpurhey	5th April, 1895	21st August, 1895
Shop, Bakehouse, &c., Exchange Street and Cambridge Street, Cheetham	19th July, 1895	17th April, 1896
Shop, Dwelling-house, Bakehouse, &c., Ashton New Road, Clayton	4th November, 1895	Not yet commenced

G. M. MOYES,

Building Surveyor.

14th July, 1896.

These comply, of course, with the building bye-laws, and in addition the following requirements of the Medical Officer of Health have been carried out: —

The angles of the ceilings of bakehouses to be coved.

Walls to be smooth, and such as not to lodge dirt; they should therefore be lined internally with cement or closely fitting glazed bricks.

Attached to the w.c. should be a lavatory basin, so that the bakers may wash their hands.

Bakehouses to be effectively ventilated by two external walls with windows therein.

Extraction shafts to be provided in the brickwork adjoining the oven flue.

All walls to bakehouses to be at least 14 inches thick.

Staircase from bakehouse to store room above to be enclosed.

The distance between bakehouses and stables to be at least 6 yards.

No sink or lavatory to be inside the bakehouse.

Permanent air inlets to be provided in bakehouse equal in area to the area of the extraction shafts.

ON THE CONDITION OF CLOSET ACCOMMODATION THROUGHOUT THE CITY.

It may be said, generally, that in all parts of the City the closet accommodation to dwellings is bad. There are nearly four times as many pails as middens, and rather more water-closets than middens. The great bulk of the latter, however, are on business premises in the centre of Manchester. The houses, generally, are served by middens or pails. The walls of the middens are pervious, and many of them adjoin houses.

The pail closets are defective to an extraordinary degree. Many of them are without a strip of metal fastened to the seat to prevent urine flowing on the ground, and in the absence of which the ground is certain to be soaked with liquid filth. But the same result is reached in many other ways. I would, therefore, beg the attention of the Council to the condition revealed by the summary on page 96 made for me by the Sanitary Inspectors of what they found on a house-to-house inspection, which was abandoned by them from pressure of work.

I am prepared to allow, and even to maintain, that the condition of things revealed by an inspection of all the closets in the City would not show results so adverse as these figures do, although in the absence of a complete inspection I cannot draw any positive conclusions as to the connection of fevers with closet conditions, so far as these depend on a knowledge of the state of the closets at houses where fever has occurred. But it is manifest that the state of things here indicated calls for a complete change in the system of removal of excreta.

INQUIRY INTO PRESENT CONDITION OF PRIVIES.

CHARACTER OF CLOSET				No Urine Guide, or Defective	Midden against house	Pail against house
Midden	Pail	W.C.	Both			
2,250	2,914	1,026	...	867	757	1,399
...	20	...	...	2	...	...
...	19	...	...	...	...	...
21	...	...	...	...	...	...
17	...	...	...	...	...	...
2,288	2,953	1,026	...	869	757	1,399

At the same time it would be necessary to have a very thorough alteration in the drains of houses and in the passage sewers. The expense of these reforms would be great, no doubt.

On the other hand, I do not think there need be the slightest hesitation in affirming that the death-rate would be reduced by such a change.

Supposing it were reduced 2 per 1,000, what pecuniary benefit does that represent?

Accepting Dr. Farr's statement of the value of human life—men, women, and children—at £159 a head, as quoted in the introduction to the Report of the Medical Officer of the Local Government Board, such a reduction would mean an annual saving of £159,000, which would much more than pay the interest on any sum expended.

Apart from this aspect of the matter, which admits of other considerations that would lead us somewhat afield, it is doubtful whether the saving in labour, &c., to the Corporation would not pay the interest of the sum required to assist in the conversion from one system to another.

In any case, I must express a decided opinion that the conversion, safeguarded by efficient drainage, is urgently called for.

Report by Mr. A. T. Rook, Superintendent of the Sanitary Department.

Sanitary Department,
Town Hall, Manchester,
June, 1896.

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1895, I beg to state that the City, for inspection and other purposes, has been divided into 28 districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there are also four Smoke, one Canal Boats, two Adulteration of Food, and six Factory and Workshops Inspectors.

The number of complaints of nuisances of various kinds made during the year was 54,563, viz.:—

2,135 through the Medical Officer of Health's Department.
1,760 by the Public
6,589 through the Police
44,079 by the Staff.

The number of inspections and re-inspections was as follows*:—

47,397	Dwelling-houses
3,073	Inspections and
9,525	Re-inspections of infected dwelling-houses.
359	Factories and Workshops
551	Cellars
442	Offensive trades
133	Slaughter-houses
105	Schools
2,002	Mills
316	Tips
11,212	Miscellaneous.

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* See also table for the year ending December 31st, 1895 (page 132), relating to nuisances.

For the abatement of nuisances of various kinds, 14,368 notices were served, viz. :—

To abate overcrowding	228
To cleanse and limewash houses	452
To cleanse privies	103
To cleanse bakehouses	3
To cleanse workshops	491
To discontinue nuisances arising from black smoke being emitted from chimneys	269
To repair, &c., house drains	3,951
To register houses occupied by lodgers	520
To remove offensive deposits, stagnant water, &c.	661
To abate nuisances arising from animals kept in a filthy state, or to remove such animals	164
To repair, cleanse, &c., privies, ashpits, water-closets	1,923
To provide water-closets	61
To repair yards and passages	864
To repair dilapidated houses	2,304
To cleanse and disinfect dilapidated houses	2,112
To provide urinals to public and beer houses	42
To close houses in a dilapidated, &c., condition and consequently unfit for human habitation	71
To place bakehouses in a proper sanitary condition	40
To place workshops in a proper sanitary condition	109

31,176 re-inspections have been made after notices to ascertain if the work had been done.

HOUSES LET IN LODGINGS.

Under the powers given by section 90 of the Public Health Act, the bye-laws made thereunder have been strictly enforced.

The number of houses on the register is 1,400.

To these, 2,372 day visits and 339 night visits have been paid.

40 infringements of the regulations have been reported and dealt with.

173 night visits have also been paid to unregistered houses, the occupiers having previously denied that lodgers were kept.

DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, 2,351 milkshops and dairies and 126 cowkeepers are now on the register. The number of cows kept is 1,624. The number of visits to dairies, milkshops, and cowsheds was 5,520.

It may be stated that many of the dairies and cowsheds are not in a very satisfactory condition, and great reluctance has been shown in the past, in consequence of the very serious structural alterations required, especially in cowsheds, to enforce the alterations necessary to bring them up to the present state of sanitary requirements. New regulations are now under consideration, which, it is hoped, will enable the Inspectors to deal more effectually with insanitary cowsheds, &c.

WORKSHOPS, BAKEHOUSES, AND SHOP HOURS ACTS.

Four male and two female Inspectors are appointed to carry out these Acts. The female Inspectors confine their attention to workshops where females are employed, to shops where young persons are employed, and to visiting shops where outworkers are employed. In respect of the latter, a list of outworkers is kept, and visits are paid to the houses in which the work is being done.

The City, for inspection purposes, is divided into four districts—the two female Inspectors visiting any of the districts as required.

The inspections by these Officers have already resulted in a marked improvement in the condition of the workshops and bakehouses, and the figures hereafter given do not at all represent the actual work done, as many of the occupiers have, at the request of the Inspectors, without notice, made alterations for improving the ventilation, lighting, and cleansing, &c.

As regards the Shop Hours Act, there is every reason to believe that, with few exceptions, the Act is now being fairly well observed.

The work done by these Officers under the above Acts is shown by the following tables.

Work done by the Inspectors under the Acts from the 20th September, 1894, to 18th September, 1895, inclusive.

Number of District	INSPECTOR	SHOPS						WORKSHOPS							Number of visits to houses where outworkers are employed	Factories and Workshops not provided with proper means of escape in case of fire	BAKEHOUSES					
		Number of visits	Number reported for offences against the Act	Number of copies of Abstract distributed	Number registered during the year	Number struck off register during the year	Total number on register	Number of visits	Number of Lists of Outworkers, &c., distributed	Number of Sanitary Defects reported	Number of reports sent to Factory Inspector	Number registered during the year	Number struck off register during the year	Total number on register			Number of visits	Number of Sanitary Defects reported	Number of reports sent to Factory Inspector	Number registered during the year	Number struck off register during the year	Total number on register
1	Edward E. Roberts	207	12	12	12	17	514	2547	47	568	207	486	125	986	2	12	731	153	18	18	9	74
2	John Kewley	46	6	2	1	1	627	2151	7	297	62	599	115	1180	2	1	718	103	9	20	15	130
3	Albert G. Thatcher	399	5	38	38	41	554	2284	15	272	81	716	129	1052	...	...	702	125	6	41	15	103
4	Francis J. Rowe ...	33	5	1	1	1	724	2649	17	463	102	654	82	1272	...	4	839	116	32	12	18	110
...	Emma Coppock ...	2558	3	224	235	61	...	1350	48	83	37	...	12	...	653	...	...	...	...	...	...	...
...	Alice Tattersall ...	1183	10	116	113	81	...	1447	45	27	55	...	41	...	1336	...	2	...	...	...	...	...
...	TOTALS......	4426	41 *	393	400	202	2419	12428	179	1710 †	544	2455	504	4490	1993	17 ‡	2992	497 §	65	91	57	417

* In the whole of the 41 cases reported for infringements of the Shop Hours Act, the persons are now complying with the Act.

† Of the 1,710 defects in Factories and Workshops, 132 of the cases have been referred to the City Surveyor to prepare plans for improved closet accommodation, in 14 of which cases the necessary accommodation has been provided; 1,431 have been remedied, and 147 not remedied (76 notices have been served and 71 occupiers have promised to make good the defects).

‡ 17 Factories have been reported as not being provided on the storeys above the ground floor with such means of escape in case of fire for the persons employed therein as can reasonably be required under the circumstances of each case—12 notices have been served to make the necessary provision, 3 of which have been complied with, and 5 cases referred to the City Surveyor for report thereon.

§ Of the 497 defects in Bakehouses, 459 have been remedied, 12 Bakehouses closed, and 26 not remedied (in 9 of these cases the Medical Officer of Health reported the premises to be unfit for use on sanitary grounds, and the Sub-Committee referred them to the Town Clerk to take legal proceedings against the occupiers, 3 notices have been served, and 14 occupiers have promised to make good the defects).

PROSECUTIONS FOR OFFENCES, WITH RESULTS.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid		
			£	s.	d.	£	s.	d.
Samuel Shirley	87, London Road	Employing a young person over 74 hours per week	0	10	0	0	8	6
Manchester Warehousemen and Clerks' Restaurant Co. (Norman Spencer, Sec.)	35, Deansgate	Ditto ditto	1	0	0	0	16	0
Ditto	8, Saint Mary's Gate	Ditto ditto	1	0	0	0	8	6
Ditto	133, Great Ducie Street	Ditto ditto	......			0	6	0
Robert K Wadsworth	121, London Road	Ditto ditto	Withdrawn					
William Hudson	14, Stretford Road	Ditto ditto	Referred to Chairman to confer with Town Clerk					
Ditto	Ditto	Ditto ditto						
Alfred Brown	72, Tame Street	Having his bakehouse in a dirty condition	0	10	0	0	8	6
Paul Green	11, Chapel Street	Ditto ditto	......			0	3	6
Samuel Cohen	18, Fernie Street, Red Bank	Ditto ditto	0	1	0	0	2	6
John Rogerson	8, Rosamond Street East	Ditto ditto	1	0	0	0	8	6
Solom'n Rosenbloom	214, Cheetham Hill Road	Ditto ditto	0	10	6	0	8	6
Frank Bent	383, Rochdale Road	Ditto ditto	2	0	0	0	8	6
John Passman	97, Ashton Old Road	Ditto ditto	0	5	0	0	5	0
Minnie Carnofski	22, Bury New Road	Ditto ditto	0	5	0	0	5	0
Louis Cohen	38 and 40, Fernie Street	Ditto ditto	Pending					
Eli Morris	11, Lord Street, Cheetham	Ditto ditto						
		Carried forward	7	1	6	4	9	0

PROSECUTIONS FOR OFFENCES, WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid		
			£	s.	d.	£	s.	d.
		Brought forward.........	7	1	6	4	9	0
Elizabeth Potts......	87, Lower Moss Lane	Not keeping a list showing the names and addresses of persons employed by her as outworkers....................	Adjourned					
Thos. Henry Bullock	30 and 32, Albert Street	Neglecting to cleanse, &c., his workshop after notice	Withdrawn					
Moses Goodman ...	12, Robert Street	Ditto ditto	0	5	0	0	5	0
Isaac Goldberg	Ditto	Ditto ditto	0	5	0	0	5	0
Lazarus Newmark...	Ditto	Ditto ditto	0	5	0	0	5	0
Joseph Gordon	Ditto	Ditto ditto	0	10	6	0	8	6
Morris Megovski ...	5, Davidson Street	Ditto ditto	1	1	0	0	8	6
Joseph Isaacs	92, Great Ducie Street.....................	Ditto ditto	0	5	0	0	5	0
Harris Moscovitch...	17, Watling Street..	Ditto ditto	0	10	0	0	8	6
Richard Challenor...	Atlas Trunk Works, Pilling Street	Ditto ditto	......			0	3	0
Frederick G. Upton	101, Bury New Road	Ditto ditto	0	5	0	0	6	0
Michael Copeland...	11, Dale Street, Red Bank	Ditto ditto	0	10	0	0	8	6
William Lyall	26, Jackson's Row	Ditto ditto	......			0	3	0
Mary E. Williams...	28, Devonshire Street	Ditto ditto	Withdrawn					
John Wm. Passman.	Ainsworth Street, Ardwick	Occupying premises certified by the Medical Officer of Health to be unfit for use as a Bakehouse on sanitary grounds	0	10	6	0	8	6
		Carried forward.........	11	8	6	8	3	6

PROSECUTIONS FOR OFFENCES, WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid		
			£	s.	d.	£	s.	d.
		Brought forward........	11	8	6	8	3	6
Charles Wardle ...	4, Butler Street, Oldham Road	Occupying premises certified by the Medical Officer of Health to be unfit for use as a Bakehouse on Sanitary grounds	Withdrawn			(repaired)		
William Artingstall...	112, Collyhurst Street	Ditto ditto ...	Withdrawn			(closed)		
Maria Simcock	20, Rodney Street	Ditto ditto ...	Withdrawn			(closed)		
John Guest	57, Chancery Lane	Ditto ditto ...	Withdrawn			(repaired)		
John Stevens.........	55, George Street, Hulme	Ditto ditto ...	Withdrawn			(closed)		
John Skelton.........	29, Medlock Street, Hulme.............	Ditto ditto ...	1	0	0	0	8	6
Thomas Lunt	60, Lloyd Street, Hulme	Ditto ditto ...	Adjourned					
Thos. Higginbottom	60, Rochdale Road	Ditto ditto ...	1	0	0	0	8	6
Thomas Kennaugh..	237, Deansgate...........................	Ditto ditto ...	Pending					
Jacob Earnshaw ...	South King Street	Neglecting to comply with Notice to provide satisfactory closet accommodation at— 26, Cotton St., Ancoats	Adjourned					
John Wainwright ...	87, Market Street	Ditto 23, China Lane						
Robert Neill & others	Broughton Lane	Ditto 5, Nightingale Street ...						
Thomas Lees	26, Victoria Street	Ditto 107a, Upper Moss Lane						
John Wilkinson......	Lever Street	Ditto 99, Stretford Road......						
J. Marriott...........	Norfolk Street	Ditto 47 and 49, Lever Street						
Geo. Wadsworth ...	Albert Square	Ditto 51a, Grosvenor Street...						
John Biesty		Ditto Atlas Works, Pilling St.						
		TOTAL...........£	13	8	6	9	0	6

SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 1,797 timed observations of half-an-hour each, with the result that 269 notices for the abatement of nuisances have been served. In addition to which, proceedings before the magistrates have been ordered in 170 cases out of 280 offences reported. These cases were disposed of as follows :—

170 were summoned before the Justices, in 98 of which fines were imposed amounting to £180 19s. 0d., and costs £42 16s. 8d.

1 was ordered to pay costs only.

58 Orders of Abatement were granted and served, and 13 cases were excused, dismissed, or withdrawn.

Much attention during the past year, as will be seen by the above, has been given to the nuisance caused by the emission of black smoke, not only from the furnaces connected with boilers in mills, warehouses, and other works, but also from chemical and other industries, and the efforts made have already resulted in a considerable reduction of the nuisance. It is hoped that the proceedings now pending against certain grave offenders will have a further beneficial effect.

FOOD AND DRUGS ACT AND MARGARINE ACT.

Under these Acts, the two Inspectors specially appointed have purchased for analysis 1,629 samples. Of these, 54 only were adulterated, viz. :—

Cheese	4
Coffee	2
Butter	5
Lard	1
Milk	38
Mineral Waters	1
Mustard	3

51 summonses were issued. In 35 cases fines were imposed, amounting in the aggregate to £150 13s. 6d., and the costs £77 7s. 6d.

14 summonses were dismissed or withdrawn.

2 were ordered to pay costs only.

In the case of the mineral water it was certified to contain a slight trace of lead, and the manufacturer was communicated with, and steps were taken by him to prevent a recurrence of the contamination.

CANAL BOATS ACTS.

The number of canal boats on the register is 656.

The number inspected was 2,048, resulting in 9 infringements of the Act being discovered, which were referred to the Justices to be dealt with: 4 being fined, the fines amounting in the aggregate to £1 15s., and the costs £2 19s. 2d.

1 was ordered to pay costs only.

4 summonses were withdrawn, and 185 caution notices were sent to the owners and masters.

OFFENSIVE TRADES.

The number of offensive trades on the register is 276. These have been placed under close supervision, and periodical visits paid.

UNHEALTHY DWELLINGS.

During the year, 1,189 houses were certified to be dealt with by the Sanitary Committee.

1,083 of these were ordered to be closed.

A large proportion of these houses have since had structural alterations made to them which satisfied the requirements of the Medical Officer of Health, and have since been allowed to be reinhabited.

CLOSET ACCOMMODATION TO WORKSHOPS, WAREHOUSES, &c.

145 properties were reported as being deficient in closet accommodation.

In a large number of cases the necessary accommodation has been provided, and in others orders have been made to provide the necessary accommodation, or the reports are under consideration.

I am again unable to conclude this report without calling attention to the very serious danger to health arising from the present pail-closet and midden systems. During the last twelve months many owners of property have substituted water-closets for pail or midden closets, and where the change has taken place great satisfaction has resulted.

ON THE OPERATIONS OF THE SANITARY COMMITTEE IN REGARD TO INSANITARY DWELLINGS,

BY

MR. A. W. LAWSON, OF THE CITY SURVEYOR'S DEPARTMENT.

In dealing with the back-to-back houses in the City, the Sanitary Committee have had in view so to alter these houses where possible as to give to the occupants a sufficient supply of fresh air and light, while putting them under conditions favourable to the easy maintenance of cleanliness both inside and outside the houses.

Where it has been found impossible, by any alterations, to attain these elementary requirements of healthy existence, or where the houses were in a hopeless state of dilapidation, they have been permanently closed. In pursuing the object of obtaining pure air, light, and cleanliness for the altered houses, the Committee have had to vary considerably the plans on which alterations could be effected. Generally these objects, especially with wide streets at the front and back of the houses, are best attained by removing the two centre houses (one at the front and one at the back) in every three pairs of houses, and converting the space thus obtained into yards. In some cases, at the ends of blocks, two houses, both back and front, are added together to form double houses, and the third pair demolished to provide the requisite yard space for such double houses. At the same time a water-closet is erected in the yard of a simple but efficient character, with the cistern inside the house. An ashbox is also provided. In this way the filthy condition of the privies and ashpits is done away with, and the yards being so constructed as to be easily cleaned, the tenants are enabled to maintain them in a satisfactory condition.

The cases of back-to-back houses surrounded by narrow streets are dealt with by the entire removal of one row on the most suitable side of the block, and the open space so formed is utilised for yards. A similar alteration to this, provided the width of streets and size of houses admit, is effected by the removal of a portion only, transversely, of the houses on one side of the block, the remaining portion being added to the houses left standing, to form sculleries with bedrooms over.

In places where one row of a block of houses fronts to a court or private street of sufficient area, and providing there are no conflicting interests, alterations are effected by adding the back-to-back houses together in pairs to form "through" houses, and separate yards made (by absorbing a portion of the street or court), together with a passage not less than nine feet wide. By the removal of an entire block of dwellings an arrangement of the site is sometimes obtainable by which back streets and yards for the surrounding houses are secured without any very large structural alterations to the houses.

Where alterations are not allowed, the owners are, as far as possible, induced to demolish the houses, provided the position renders such a course desirable. Should an owner decide to build new houses upon the site, or deal with the buildings in any way, except by altering for improved dwellings, the bye-laws for new streets and buildings come in force.

All houses coming under the notice of the Unhealthy Dwellings Committee, besides being structurally altered as is found necessary, are required to be thoroughly repaired, cleaned, papered, and painted, both inside and out, before being re-occupied or the closing orders being rescinded. Every house has also to be supplied internally with a service of water over a slopstone.

It may be remarked that it is the practice not to serve the Closing Orders in those cases where the owners make arrangements to alter within a reasonable time after the passing of the Order, it being the object to cause as little inconvenience as possible either to owner or tenant.

Wherever houses are demolished to form yards, passages, or open spaces, which are of general benefit to the adjoining houses, the Committee make an allowance towards the expense of flagging and other work for each house removed. During the year under review 481 houses were ordered to be closed, but as the negotiations for and execution of the alterations take a very considerable time (in most cases, mortgagees, trustees, or beneficiaries have to be consulted), only a small proportion of this number have at the end of the year been reported as altered or demolished. Since the end of the year, however, a very considerable number of the above houses have been completed or are now approaching completion. From the commencement of the Committee's operations in 1885, the premises in fully half of the cases dealt with have been structurally altered in a satisfactory manner.

The provision of adequate yards, air space, and the admission of light for every portion of the houses, together with through ventilation, necessarily makes an improvement in the health and habits of the tenants. They attain a higher standard of self-respect, and take greater pride in keeping their houses clean and attractive. The effect, generally, upon the whole community must be for the better.

REPORT OF MR. R. D. CALLISON, INDOOR SUPERINTENDENT OF THE CLEANSING DEPARTMENT.

Cleansing Department,
Town Hall, Manchester,
24th August, 1896.

Dear Sir,

PARTICULARS RELATING TO THE WORK DONE BY THE CLEANSING DEPARTMENT.

I have pleasure in submitting for your information the following details with reference to the work done during the past year in this department:—

We have removed from the City, and disposed of during the past year, 345,786 tons of refuse; of this, 48,466 tons have been sent to Carrington, 107,883 tons have been deposited on the Committee's tips at Clayton and Harpurhey, and 112,738 tons disposed of through destructor furnaces and by evaporation. We have removed from the markets within the City during the past year 6,183 tons of market garbage. This material is carted to our Water Street Depot, and there loaded as expeditiously as possible into boats, and disposed of to farmers or sent to Carrington Moss Estate.

We have collected during the year from the abattoirs and private slaughter-houses 5,000 tons of slaughter-house refuse; this offensive matter is dealt with at our Holt Town Works. It is there deprived of its fatty constituents, and the remainder is passed through concentrators, where it is evaporated to dryness. The dry material is then added to our concentrated manure.

During the year we have made at Holt Town 7,191 tons of concentrated manure. There are over 60 destructor furnaces of different kinds at our various depots within the City.

We made 15,979 tons of mortar from the clinkers obtained from the destructor furnaces last year.

We employ over 100 orderly boys, who collect horse-droppings and litter from the streets, which they deposit in the orderly bins. which are fixed in the footpath. The contents of the bins are removed frequently to the nearest depot.

During the past year special pails and lids have been supplied for all cases of enteric fever; labels are attached to the pails, as suggested by you, requesting the occupants to use disinfectants, which we supply with the pails. A special vehicle is employed for the removal of the fœcal matter and washings from such cases. The contents of the pails are separately dealt with at our Holt Town Depot. During the year 332,060 courts and passages have been swept, cleansed, and swilled; 75,310 barrels of water have been put upon the streets; and 251,352 grids have been opened. 10,235 urine guides have been fixed to defective closets during the year, and we continue to engage men solely for repairing and refixing urine guides.

The following figures apply with regard to work done by the Cleansing Department for the Sanitary Department during the 12 months ending March 31st, 1896, viz.:—

Particulars.	No.
Patients removed to Hospital	2,412
Articles removed and stoved	32,860
Articles removed and burned	112
Infected rooms fumigated with chlorine	6,526
Rooms stripped and washed with a solution of chloride of lime	7,398
Urine guides fixed	10,235
Houses for which special pails have been supplied after typhoid, &c.	279

REPORT BY MR. JAMES KING, M.R.C.V.S., CHIEF INSPECTOR, MARKETS DEPARTMENT.

Abattoir,
29th July, 1896.

Sir,—I herewith submit the following report with reference to unwholesome food condemned in this City by my department under the Public Health Act 1875, during the year ending December, 1895 :—

Meat		
Beef	67,289	lbs.
Mutton	10,470	„
Veal	1,918	„
Pork	23,101	„
Total...	102,778	„
Fish	218,422	
Shell Fish	57,771	
Total...	276,193	
Game	269	
Poultry	1,059	
Rabbits	5,322	
Total...	6,650	

Miscellaneous		
Beans	40	Bags
Turnips	5	„
Onions	80	Cases
Mushrooms	1	„
Bananas	27	„
Oranges	4	„
Tomatoes	1	„
Cauliflowers	2	Crates
Mixed Fruit, 878lbs. and	10	Baskets
Bilberries	50	„
Black Currants	5	„
Raspberries	1	„
Watercress	2	„

The number of carcases, portions of carcases, and consignments of fish, &c., condemned during the year has been 1,647, and from the following causes :—

Decomposing	1,183	Parturient Fever	15
Tuberculosis	120	Parasitic Disease	13
Pneumonia	75	Rheumatism	8
Suffocation	69	Peritonitis	6
Dropsy	52	Unseasonable	3
Swine Fever	36	Pyæmia	3
Injuries	35	Nephritis	1
Unmarketable	27	Jaundice	1

Of the meat and fish there was condemned—

In the Abattoir and Carcase Market	67,739	lbs.
,, Rusholme Abattoir	568	,,
,, Pig Market	12,682	,,
,, Private Slaughter-houses	18,624	,,
,, Railway Stations	23,997	,,
,, Retail Shops and Hawkers' Carts	1,527	,,
,, Smithfield Market (Fish)	259,982	,,
,, Rose Cottage Farm	260	,,

The game, poultry, and rabbits were condemned in the Wholesale Fish Market. The vegetables and fruit in Smithfield Fruit Market, shops, and hawkers' carts.

Of the above quantity of meat given as condemned in the Carcase Market and Abattoir, 31,069lbs. was dressed meat consigned from places other than the City—this meat being sent to the Abattoir for inspection before being sold. Every encouragement is given to this trade, as it is a means of bringing all suspicious meat to a convenient centre, where the opinion of an inspector may be obtained without fear of prosecution, thus preventing large quantities of diseased meat being consigned to and sold in the shops, which, owing to the large amount of work in connection with the principal markets and private slaughter-houses, it was impossible for two inspectors (self and assistant) to devote the necessary time to thoroughly inspect.

It will be seen that tuberculosis is the disease most frequently met with, and is the cause of a large quantity of meat having to be condemned. Since the publication of the Report of the Royal Commission on Tuberculosis, which allows that the flesh of cattle suffering from that disease, if only locally affected, can (if proper care be exercised in the removal of the diseased parts) be used for the food of man, we endeavour to see as many cattle killed as possible, and when the disease is observed in the course of dressing, the removal of the diseased parts is done by or under the supervision of an inspector, and every means employed to prevent contamination of sound meat by the butchers' knives, &c., the portions condemned being at once removed from the slaughter-house and disinfected.

There are 102 private slaughter-houses on the register, which are visited by us as often as possible. Some of these are only used temporarily, for the purpose of dressing an occasional beast or a few sheep, the butchers finding it more convenient to purchase at the Carcase Market. Speaking generally, they are kept in a cleaner condition than formerly.

TABLES.

TABLE A.—MANCHESTER, 1895.

Causes of Death at different Life Periods in the 52 weeks of the year.

PERSONS.—(MALES AND FEMALES.)

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years 0 to 1	Under 5 Years 1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
All Causes	12915	3566	2233	352	175	244	309	763	1078	1262	1303	1050	509	71
I. Zymotic Diseases......	2,405	938	960	102	16	32	33	72	61	56	53	54	24	4
II. Parasitic Diseases ...	4	4	...	...	...	...	...	...	...	..	...	...	...	...
III. Dietetic Diseases ...	46	...	...	...	...	...	...	2	18	17	6	3	...	...
IV. Constitutional Dis:.	2,224	239	267	71	65	109	136	315	378	305	205	109	24	1
V. Developmental Dis:.	630	390	1	1	...	...	...	...	...	1	18	63	126	30
VI. Local Diseases.........	6,126	1153	851	146	79	90	125	327	553	796	923	751	300	32
VII. Violence..................	419	89	58	29	15	10	13	33	48	44	41	27	10	2
VIII. Ill-defined Causes...	1,061	753	96	3	...	3	2	14	20	43	57	43	25	2
I.—Zymotic Diseases.														
1. Miasmatic Diseases.														
Smallpox.. Vaccinated	2	1	...	...	...	...	...	...	...	1	...	...	...	...
Smallpox.. Unvaccinated......	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smallpox.. No Statement......	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chickenpox	3	1	1	1	...	...	...	...	...	...	...	...	...	...
Measles	505	97	385	21	1	...	...	...	1	...	...	...	...	...
Epidemic Rose Rash	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever..	173	13	116	34	6	...	1	3	...	...	...	...	...	...
Typhus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza	194	5	15	2	2	5	5	30	29	28	33	26	12	2
Whooping Cough	250	93	146	11	...	...	...	...	...	...	...	...	...	...
Mumps	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diphtheria	72	8	42	19	2	1	...	...	...	...	...	...	...	...
Membranous Croup	41	7	30	4	...	...	...	...	...	...	...	...	...	...
Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple and Ill-defined Fever ...	4	2	...	1	...	...	...	...	...	1	...	...	...	...
Enteric Fever	95	...	6	3	4	24	17	18	15	4	1	3	...	...
Other Miasmatic Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2. Diarrhœal Diseases.														
Simple Cholera	29	19	5	...	...	...	...	...	...	2	1	2	...	...
Diarrhœa, Dysentery	875	611	203	3	1	...	...	3	6	9	9	19	9	2
3. Malarial Diseases.														
Remittent Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ague	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4. Zoogenous Diseases.														
Hydrophobia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glanders.............................	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Splenic Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cowpox and other effects of Vac:	2	2	...	...	...	...	...	...	...	...	...	...	...	...
5. Venereal Diseases.														
Syphilis	70	61	6	...	...	...	...	1	1	1	...	...	...	...
Gonorrhœa, Stricture of Urethra	15	...	...	...	...	...	1	1	3	6	4	...	...	...
6. Septic Diseases.														
Phagedæna	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erysipelas	37	15	...	1	...	...	1	2	2	4	5	4	3	...
Pyæmia, Septicæmia	16	3	5	2	...	2	1	2	1	...	...	...	...	...
Puerperal Fever	22	...	...	...	...	...	7	12	3	...	...	...	...	...
II.—Parasitic Diseases.														
Thrush	4	4	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: from Veg: Parasites	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydatid Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: from Animal Par:...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE A, 1895—*continued.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
III.—Dietetic Diseases.														
Starvation, Want of Breast Milk	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scurvy	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Intem: { Chronic Alcoholism	41	...	...	...	...	...	...	2	14	16	6	3	...	...
Intem: { Delirium Tremens	4	...	...	...	...	...	...	...	3	1	...	...	...	...
IV.—Constitutional Diseases.														
Rheum: Fev: Rheum: of Heart	33	...	1	3	6	4	2	5	5	4	2	...	1	...
Rheumatism	41	...	...	...	1	3	2	3	5	9	7	6	5	...
Gout	7	...	...	...	...	...	...	...	...	4	1	2	...	...
Rickets	61	22	36	1	1	...	...	1	...	...	...	...	...	...
Cancer	334	...	3	2	...	1	5	12	42	90	97	65	16	1
Tabes Mesenterica	117	65	47	3	2	...	...	...	...	...	...	...	...	...
Tuberc: Mening: (Hydroceph:)	185	70	78	23	4	5	2	2	...	1	...	...	...	...
Phthisis	1,139	8	23	16	32	78	113	277	311	179	80	22	...	...
Other forms of Tuberc: Scrofula	223	69	73	22	14	13	·9	8	5	4	4	2	...	...
Purpura, Hæmorrhagic Diathesis	4	...	...	...	1	...	...	...	2	...	...	1	...	...
Anæmia, Chlorosis, Leucocy:	48	5	5	1	3	2	3	4	6	7	4	8	...	...
Diabetes Mellitus	29	...	...	...	1	3	...	3	2	6	9	3	2	...
Other Constitutional Diseases	3	...	1	...	...	...	...	...	...	1	1	...	...	...
V.—Developmental Diseases.														
Premature Birth	330	330	...	...	...	...	...	...	...	...	...	...	...	...
Atelectasis	12	12	...	...	...	...	...	...	...	...	...	...	...	...
Cyanosis	19	18	...	...	...	...	...	...	...	1	...	...	...	...
Spina Bifida	10	10	...	...	...	...	...	...	...	...	...	...	...	...
Imperforate Anus	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate Harelip	6	5	...	1	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects	14	13	1	...	...	...	...	...	...	...	...	...	...	...
Old Age	237	...	...	...	...	...	...	...	...	...	18	63	126	30
VI.—Local Diseases.														
1.—NERVOUS SYSTEM (DIS: OF).														
Inflam: of Brain or its Mem:	185	60	67	26	5	4	...	5	5	6	4	3	...	...
Apoplexy	268	3	1	...	1	2	2	6	22	48	76	63	37	7
Softening of the Brain	33	...	...	...	...	...	...	...	2	4	9	11	6	1
Hemiplegia, Brain Paralysis	146	...	1	...	2	1	...	7	14	18	42	43	17	1
Paralysis Agitans	3	...	...	...	...	...	...	...	...	1	1	...	...	1
Insanity, Gen: Par: of Insane	142	...	...	...	1	1	3	21	29	22	25	27	12	1
Chorea	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	36	...	3	1	...	1	2	6	6	8	4	5	...	...
Convulsions	258	209	43	6	...	...	...	...	...	...	...	...	...	...
Laryngismus Stridulus	25	16	7	2	...	...	...	...	...	...	...	...	...	...
Idiopathic Tetanus	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Paraplegia, Dis: of Spinal Cord	34	...	1	1	...	...	1	1	6	8	7	8	1	...
Other Diseases of Nervous Sys:	71	13	9	4	1	3	4	9	9	8	5	5	1	...
2. ORGANS OF SPECIAL SENSE (DISEASES OF).														
Otitis, Otorrhœa	20	4	6	2	1	1	2	2	...	...	1	1	...	...
Epistaxis and Disease of Nose	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Ophthalmia and Disease of Eye.	1	1	...	...	...	...	...	...	...	...	...	...	...	...
3. CIRCULATORY SYS: (DIS: OF)														
Endocarditis	17	...	1	...	1	2	2	5	1	1	4	...	...	...
Valvular Disease	193	1	...	4	5	9	5	28	43	32	35	23	7	1
Pericarditis	9	...	...	1	...	1	1	2	1	1	...	1	...	1
Hypertrophy of Heart	3	...	...	...	1	...	...	...	1	...	...	...	1	...
Angina Pectoris	10	...	...	...	...	...	1	...	2	1	4	2	...	...
Syncope	43	4	1	1	...	1	...	...	5	1	11	8	8	3

TABLE A, 1895—*continued.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
3. CIRCULATORY SYS: (DIS: OF) *(continued)*														
Aneurism	10	...	...	...	...	...	1	...	4	4	1	...	...	...
Senile Gangrene	5	...	...	...	...	...	...	...	...	1	...	2	1	1
Embolism, Thrombosis	36	...	...	...	...	1	2	4	5	8	6	3	6	1
Phlebitis	2	...	...	...	...	...	...	...	...	...	1	1	...	...
Varicose Veins	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis : of Circulatory Sys :	617	7	4	4	13	11	12	28	82	131	156	122	44	3
4. RESPIRATORY SYS: (DIS: OF)														
Laryngitis	18	1	11	4	...	...	...	...	...	...	...	...	2	...
Croup	18	2	15	1	...	...	...	...	...	...	...	...	...	...
OtherDis:of Larynx and Trachea	7	1	3	1	...	...	2	...	...	...	...	...	...	...
Emphysema, Asthma	21	...	1	...	...	...	...	...	1	5	5	4	4	1
Bronchitis	1,388	311	183	13	4	4	5	26	65	170	253	250	96	8
Pneumonia	1,387	274	371	51	20	21	41	86	137	154	124	84	24	...
Pleurisy	50	...	6	2	3	1	2	5	7	5	11	5	3	...
Other Dis: of Resp: System	132	34	25	3	2	2	2	4	6	13	21	13	5	2
5. DIGESTIVE SYS: (DIS: OF).														
Stomatitis	17	11	5	...	..	...	...	...	...	1	...	...	...	...
Dentition	49	26	23	...	...	...	...	...	...	...	...	...	...	...
Sore-throat, Quinsy	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Dyspepsia	21	10	2	...	...	...	...	...	...	3	2	1	3	...
Hæmatemesis	4	...	...	...	...	...	...	...	2	2	...	...	...	...
Melæna	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Diseases of Stomach	71	33	8	...	...	2	3	5	8	5	5	2	...	...
Enteritis	116	71	22	2	...	1	2	5	3	6	2	...	2	...
Ulceration of Intestine	5	1	...	1	...	...	1	...	1	...	1	...	...	...
Ileus, Obstruction of Intestine..	30	4	3	...	3	...	3	2	4	3	5	3	...	...
Strict: or Strang: of Intestine...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intussusception of Intestine	3	1	...	...	...	...	...	...	...	2	...	...	...	...
Hernia	18	3	...	...	...	...	1	1	1	2	3	4	3	...
Fistula	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Peritonitis	45	2	2	3	2	4	4	7	7	6	6	1	1	...
Ascites	3	...	...	...	...	...	...	...	...	1	...	2	...	...
Gallstones	2	...	...	...	...	...	...	...	...	...	1	1	...	...
Cirrhosis of Liver	61	...	...	...	1	...	1	..	17	17	19	5	1	...
Other Diseases of Liver	53	15	...	3	...	...	1	2	6	14	8	3	1	...
Other Dis: of Digestive System	47	13	4	2	2	2	2	3	2	8	2	4	3	...
6. LYMPH: SYS: AND DUCTLESS GLANDS (DIS: OF).														
Diseases of Lymphatic System.	9	...	...	...	3	1	1	2	...	1	1	...	...	...
Diseases of Spleen	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchocele	3	...	...	...	...	...	...	2	...	...	...	1	...	...
Addison's Disease	2	...	...	...	...	...	1	...	...	1	...	...	...	...
7. URINARY SYSTEM (DIS: OF).														
Acute Nephritis	70	...	13	5	1	2	4	11	10	12	7	4	1	...
Bright's Disease	128	...	3	...	3	3	4	8	18	36	34	16	3	...
Uræmia	12	...	...	...	1	...	...	2	1	2	3	3	...	...
Suppression of Urine	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Calculus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmaturia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dis: of Bladder and Prostate ...	25	...	...	...	...	...	...	2	...	3	7	11	2	...
Other Dis: of Urinary System..	20	1	2	1	...	1	...	4	1	4	4	2	...	...
8. REPRODUCTIVE SYSTEM (DISEASES OF).														
(a) Generative Organs (Dis: of):														
Ovarian Disease	8	...	...	...	...	1	1	1	1	2	1	1	...	...
Diseases of Uterus and Vagina.	8	...	1	...	...	...	...	2	3	1	...	1	...	...
Disorders of Menstruation	1	...	...	...	...	...	...	...	1	...	...	...	...	...

TABLE A, 1895—*concluded.*

CAUSES OF DEATH	All Ages	Ages at Death Under 5 Years 0 to 1	 1 to 5	 5 to 10	 10 to 15	 15 to 20	 20 to 25	 25 to 35	 35 to 45	 45 to 55	 55 to 65	 65 to 75	 75 to 85	 85 and upwards
8. REPRODUCTIVE SYSTEM (DIS: OF)—*continued.*														
Pelvic Abscess	4	...	...	...	...	...	...	3	1	...	...	...	...	...
Perineal Abscess	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dis: of Testes, Penis, Scrotum, &c.	5	2	1	...	...	...	...	...	...	...	...	...	2	...
(b) Parturition, Disease of:														
Abortion, Miscarriage	5	...	...	...	...	...	1	3	1	...	...	...	...	...
Puerperal Mania	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Convulsions	3	...	...	...	...	1	...	2	...	...	...	...	...	...
Placenta Prævia, Flooding	10	...	...	...	...	...	...	5	5	...	...	...	...	...
Phlegmasia Dolens	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Accidents of Childbirth	14	...	...	...	...	2	1	5	4	2	...	...	...	...
9. LOCOMOTOR SYS: (DIS: OF).														
Caries, Necrosis	17	...	2	1	1	1	3	2	1	4	1	...	1	...
Arthritis, Ostitis, Periostitis	4	1	...	1	...	...	...	...	...	1	1	...	...	...
Other Dis: of Locom: Sys:	11	2	...	.:.	2	2	1	2	1	...	1	...	...	...
10. INTEGUMENTARY SYSTEM (DISEASES OF).														
Carbuncle	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phlegmon, Cellulitis	10	6	...	...	...	1	...	...	...	2	...	1	...	...
Lupus	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Ulcer, Bedsore	5	...	...	...	...	...	...	...	...	3	1	...	1	...
Eczema	8	6	...	...	...	...	...	1	...	...	1	...	...	...
Pemphigus	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: of Integ: Sys:	3	...	1	...	...	...	...	...	...	1	...	1	...	...
VII.—Violence.														
1. ACCIDENT OR NEGLIGENCE.														
Fractures, Contusions	148	3	11	8	9	6	6	13	21	18	28	17	6	2
Gunshot Wounds	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cut, Stab	2	1	...	...	...	...	...	...	...	...	...	1	...	...
Burn, Scald	85	6	40	17	...	1	2	2	5	2	5	4	1	...
Poison	14	1	...	...	1	...	1	4	4	1	...	1	1	...
Drowning	29	...	1	3	4	1	...	4	6	6	2	1	1	...
Suffocation	86	76	4	1	...	...	1	1	...	1	1	1	...	...
Otherwise	5	...	2	...	...	...	...	...	1	2	...	...	...	...
2. HOMICIDE.														
Murder, Manslaughter	6	2	...	...	1	1	...	1	1	...	...	...	...	...
3. SUICIDE.														
Gunshot Wounds	4	...	...	...	...	...	...	1	...	2	...	...	1	...
Cut, Stab	5	...	...	...	...	1	...	...	2	1	1	...	...	...
Poison	21	...	...	...	...	...	3	3	5	7	3	...	...	...
Drowning	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Hanging	11	...	...	...	...	...	...	3	2	3	1	2	...	...
Otherwise	2	...	...	...	...	...	...	1	...	1	...	...	...	...
VIII.—Ill-defined and not Specified Causes.														
Dropsy	6	1	...	...	...	...	1	...	...	...	...	2	2	...
Debility, Atrophy, Inanition	736	637	58	2	...	...	...	...	...	3	14	10	12	...
Mortification	2	1	...	...	...	...	...	...	...	...	1	...	...	...
Tumour	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Abscess	6	3	1	...	...	...	...	1	...	1	...	...	...	...
Hæmorrhage	2	1	...	...	...	...	...	...	...	1	...	...	...	...
Sudden (cause unascertained)	183	51	26	1	...	2	1	8	15	22	30	19	7	1
Other Ill-def: not spec: causes.	125	58	11	...	...	1	...	5	5	16	12	12	4	1

TABLE B.

SUMMARY OF TABLE A, COMPARED WITH AVERAGE DEATHS IN GROUPS OF DISEASES, 1891–94.

	Deaths	
	1895	Average 1891-94
I.—Specific Febrile, or Zymotic Diseases:		
1. Miasmatic Diseases	1,339	1,228
2. Diarrhœal ,,	904	545
3. Malarial ,,	...	...
4. Zoogenous ,,	2	2
5. Venereal ,,	85	72
6. Septic ,,	75	95
II.—Parasitic Diseases	4	7
III.—Dietetic Diseases	46	70
IV.—Constitutional Diseases	2,224	2,032
V.—Developmental Diseases	630	621
VI.—Local Diseases:		
1. Diseases of Nervous System	1,202	1,317
2. Diseases of Organs of Special Sense	22	19
3. Diseases of Circulatory System	945	899
4. Diseases of Respiratory System	3,021	2,842
5. Diseases of Digestive System	548	558
6. Diseases of Lymphatic System and Ductless Glands	14	11
7. Diseases of Urinary System	256	270
8. Diseases of Reproductive System:		
(*a*) Diseases of Generative Organs	26	29
(*b*) Diseases of Parturition	32	65
9. Diseases of Locomotor System	32	47
10. Diseases of Integumentary System	28	23
VII.—Violence:		
1. Accident or Negligence	369	353
2. Homicide	6	7
3. Suicide	44	36
VIII.—Ill-defined and not Specified Causes	1,061	854
TOTAL	12,915	12,002

TABLE C.—MANCHESTER, 1895.

Causes of Deaths at different Life Periods—MALES.

Classes	CAUSES OF DEATH	All Ages Total	Ages at Death—in years											
			Under 5 Years											
			0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	6693	1925	1153	149	89	128	156	374	625	670	658	509	235	22
I.	Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles	235	49	183	3	...	...	...	...	...	...	...	...	...	...
	Scarlet Fever	100	10	65	20	2	...	1	2	...	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	105	40	62	3	...	...	...	...	...	...	...	...	...	...
	Diphtheria	33	3	22	7	...	1	...	...	...	...	...	...	...	...
	Membranous Croup	21	5	14	2	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever	3	1	...	1	...	...	...	...	...	1	...	...	...	...
	Enteric Fever	48	...	3	1	...	12	13	9	6	3	1	...	...	...
	Influenza	112	4	10	2	2	2	3	16	19	19	18	12	5	...
	Simple Cholera	15	11	1	...	...	...	...	...	...	1	1	1	...	...
	Diarrhœa, Dysentery	460	326	101	3	...	...	...	1	4	5	3	11	4	2
	Venereal Affections	55	38	2	...	...	...	1	...	3	7	4	...	...	...
	Erysipelas	18	6	...	...	...	...	...	1	1	2	3	4	1	...
	Pyæmia	5	1	3	...	...	1	...	...	...	...	...	...	...	...
	Puerperal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Other Zymotics	1	...	1	...	...	...	...	...	...	...	...	...	...	...
II.	Parasitic Diseases	2	2	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	28	...	...	...	...	...	...	1	11	10	3	3	...	...
IV.	Rheumatic Fever	14	...	1	1	3	1	1	4	2	...	1	...	...	...
	Rickets	32	11	21	...	..	...	...	...	...	...	...	...	...	...
	Cancer	116	...	3	1	...	1	3	2	12	31	36	20	6	1
	Tabes Mesenterica	63	36	26	1	...	...	...	...	...	...	...	...	...	...
	Hydrocephalus	92	35	41	11	...	4	...	1	...	...	...	...	...	...
	Phthisis	684	7	12	9	11	38	55	153	211	122	50	16	...	...
	Scrofula, Tuberculosis	146	46	48	13	10	7	5	6	4	2	4	1	...	...
	Constitutional Diseases (other)	62	1	5	...	3	1	1	6	5	11	11	14	4	...
V.	Premature Birth	178	178	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)	29	29	...	...	...	...	...	...	...	...	...	...	...	...
	Old Age	100	...	...	...	...	...	...	...	...	...	6	27	59	8
VI.	Apoplexy, Hemiplegia	204	3	2	...	1	2	2	7	15	35	60	52	22	3
	Epilepsy	18	...	1	...	...	...	1	3	4	6	1	2	...	...
	Convulsions	138	114	23	1	...	...	...	...	...	...	...	...	...	...
	Brain and Nervous Dis. (other)	263	43	43	14	4	7	5	16	30	31	26	28	14	2
	Heart Diseases	456	6	5	5	13	12	12	28	72	86	111	72	32	2
	Croup	8	1	7	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis	651	178	87	4	3	4	2	7	33	70	111	109	41	2
	Pneumonia	807	150	193	23	13	15	27	55	94	103	76	47	11	...
	Respiratory Diseases (other)	127	22	24	4	4	1	4	4	7	15	26	8	7	1
	Digestive Organs (Diseases of)	272	109	42	5	1	4	6	9	27	30	21	15	3	...
	Urinary Organs (Diseases of)	154	...	12	4	3	2	2	16	18	31	34	27	5	...
	Reproductive Organs (Dis. of)	4	2	...	...	...	...	...	...	...	...	...	...	2	...
	Local Diseases (other)	52	15	3	2	4	4	5	5	2	6	3	2	1	...
VII.	Violence	219	41	31	9	12	7	7	18	31	28	19	14	2	...
VIII.	Marasmus, Atrophy	400	345	34	...	...	...	...	...	...	2	6	7	6	...
	Other Ill-defined Causes	163	57	22	...	...	2	...	4	14	13	23	17	10	1

TABLE D.—MANCHESTER, 1895.

Causes of Deaths at different Life Periods—FEMALES.

Classes	CAUSES OF DEATH	All Ages Total	Ages at Death—in years												
			Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
			0 to 1	1 to 5											
	All Causes	6222	1641	1080	203	86	116	153	389	453	592	645	541	274	49
I.	Smallpox	2	1	...	...	...	...	...	...	...	1	...	...	...	...
	Measles	270	48	202	18	1	...	...	...	1	...	...	...	...	...
	Scarlet Fever	73	3	51	14	4	...	...	1	...	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	145	53	84	8	...	...	...	...	...	...	...	...	...	...
	Diphtheria	39	5	20	12	2	...	...	...	...	...	...	...	...	...
	Membranous Croup	20	2	16	2	...	...	...	...	...	...	...	...	...	...
	Ill-defined Fever	1	1	...	...	...	...	...	...	...	...	...	...	...	...
	Enteric Fever	47	...	3	2	4	12	4	9	9	1	...	3	...	...
	Influenza	82	1	5	...	...	3	2	14	10	9	15	14	7	2
	Simple Cholera	14	8	4	...	...	...	...	...	...	1	...	1	...	...
	Diarrhœa, Dysentery	415	285	102	...	1	...	...	2	2	4	6	8	5	...
	Venereal Affections	30	23	4	...	...	...	...	2	1	...	...	...	...	...
	Erysipelas	19	9	...	1	...	...	1	1	1	2	2	...	2	...
	Pyæmia	11	2	2	2	...	1	1	2	1	...	...	...	...	...
	Puerperal Fever	22	...	...	...	...	...	7	12	3	...	...	...	...	...
	Other Zymotics	4	3	...	1	...	...	...	...	...	...	...	...	...	...
II.	Parasitic Diseases	2	2	...	...	...	...	...	...	...	...	...	...	...	...
III.	Dietetic Diseases, Intemperance	18	...	...	...	...	...	...	1	7	7	3	...	...	...
IV.	Rheumatic Fever	19	...	...	2	3	3	1	1	3	4	1	...	1	...
	Rickets	29	11	15	1	1	...	...	1	...	...	...	...	...	...
	Cancer	218	...	...	1	...	...	2	10	30	59	61	45	10	...
	Tabes Mesenterica	54	29	21	2	2	...	...	...	...	...	...	...	...	...
	Hydrocephalus	93	35	37	12	4	1	2	1	...	1	...	...	...	...
	Phthisis	455	1	11	7	21	40	58	124	100	57	30	6	...	...
	Scrofula, Tuberculosis	77	23	25	9	4	6	4	2	1	2	...	1	...	...
	Constitutional Diseases (other)	70	4	1	1	3	7	4	4	10	16	11	6	3	...
V.	Premature Birth	152	152	...	...	...	...	...	...	...	...	...	...	...	...
	Malform. Develop. Dis. (other)	34	31	1	1	...	...	...	...	...	1	...	...	...	...
	Old Age	137	...	...	...	...	...	...	...	...	...	12	36	67	22
VI.	Apoplexy, Hemiplegia	210	...	...	...	2	1	...	6	21	31	58	54	32	5
	Epilepsy	18	...	2	1	...	1	1	3	2	2	3	3	...	...
	Convulsions	120	95	20	5	...	...	...	...	...	...	...	...	...	...
	Brain and Nervous Dis. (other)	231	46	41	19	3	1	3	20	21	18	26	26	6	1
	Heart Diseases	489	6	1	5	7	13	12	39	72	94	107	90	35	8
	Croup	10	1	8	1	...	...	...	...	...	...	...	...	...	...
	Bronchitis	737	133	96	9	1	...	3	19	32	100	142	141	55	6
	Pneumonia	580	124	178	28	7	6	14	31	43	51	48	37	13	...
	Respiratory Diseases (other)	101	14	22	6	1	2	2	5	7	8	11	14	7	2
	Digestive Organs (Diseases of)	276	82	27	6	7	5	12	16	25	40	33	11	12	...
	Urinary Organs (Diseases of)	102	2	6	2	2	4	6	11	12	26	21	9	1	...
	Reproductive Organs (Dis. of)	54	...	2	...	...	4	3	21	16	5	1	2	...	...
	Local Diseases (other)	44	7	6	2	3	2	3	6	...	8	4	2	1	...
VII.	Violence	200	48	27	20	3	3	6	15	17	16	22	13	8	2
VIII.	Marasmus, Atrophy	336	292	24	2	...	...	...	...	...	1	8	3	6	...
	Other Ill-defined Causes	162	59	16	1	...	1	2	10	6	27	20	16	3	1

TABLE E.

CITY OF MANCHESTER, 1895.—CAUSES OF DEATH IN INFANCY AND CHILDHOOD.

CAUSES OF DEATH	UNDER ONE YEAR			Total under One Year	ONE AND UNDER FIVE YEARS				Total under Five Years
	Under 3 months	3–6 months	6–12 months		1–	2–	3–	4–	
All Causes	**1,516**	**795**	**1,255**	**3,566**	**1,303**	**489**	**267**	**174**	**5,799**
Measles	1	10	86	97	216	100	40	29	482
Scarlatina	...	...	13	13	29	43	29	15	129
Whooping Cough	16	15	62	93	72	40	23	11	239
Diphtheria (Memb: Croup)	...	2	13	15	19	20	18	15	87
Fever (various forms)	...	1	1	2	1	2	1	2	8
Diarrhœa	171	188	252	611	173	22	8	...	814
Syphilis	31	25	5	61	5	1	...	...	67
Hydrocephalus	5	18	47	70	35	23	13	7	148
Scrofula (other)	30	45	67	142	87	31	12	13	285
Premature Birth	327	3	...	330	...	...	...	...	330
Convulsions	130	35	44	209	30	9	3	1	252
Brain Diseases (other)	16	24	52	92	41	24	14	10	181
Lung Diseases	133	151	339	623	395	116	64	40	1,238
Teething	...	2	24	26	23	...	...	...	49
Atrophy, Marasmus	363	157	117	637	47	4	5	2	695
Found Dead in Bed	72	27	16	115	6	3	1	...	125
Suffocation	2	...	...	2	...	...	...	...	2
Violence (other forms)	7	1	5	13	13	19	11	11	67
Ill-defined Causes	38	17	20	75	25	3	2	2	107
Unclassified	174	74	92	340	86	29	23	16	494

TABLE F, 1871 TO 1895.—MANCHESTER.—ESTIMATED POPULATIONS. ANNUAL RATES OF MARRIAGES, BIRTHS, AND DEATHS (*a*) from all causes, and (*b*) from specified causes; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions.

Years	Estimated Populations — (Mean)	Persons Married	Annual Rates per 1,000 Persons living													Percentages to Total Deaths		Years
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Inquest Cases	Deaths in Public Institutions	
Quinquennial Averages 1871-75	477,344	24·6	38·9	28·3	0·26	0·64	1·08	0·08	0·78	0·14	0·43	0·21	1·92	0·03	0·94	7·2	13·4	1871-75 Quinquennial Averages
1876-80	509,802	18·6	38·7	26·2	0·24	0·53	1·07	0·13	0·84	0·08	0·29	0·11	1·22	0·04	0·89	7·5	14·3	1876-80
1881-85	542,746	17·9	35·1	23·6	0·04	0·71	0·48	0·10	0·68	0·05	0·20	0·03	0·96	0·03	0·72	7·0	15·9	1881-85
1886-90	575,630	16·6	33·4	24·6	0·02	0·83	0·50	0·32	0·54	0·02	0·30	0·01	1·06	0·02	0·78	6·9	17·7	1886-90
1891-95	517,801	16·9	33·2	23·6	0·03	0·62	0·26	0·27	0·64	0·00	0·24	0·01	1·14	0·05	0·77	7·1	19·2	1891-95
Avge. 25 yrs. 1871-95	524,664	18·9	35·8	25·3	0·11	0·66	0·68	0·18	0·70	0·06	0·29	0·07	1·26	0·03	0·82	7·1	16·1	1871-95 Avge. 25 yrs.
1871	464,866	24·2	38·1	29·3	0·72	0·84	0·71	0·04	0·61	0·20	0·45	0·35	2·58	0·02	0·90	6·3	13·7	1871
1872	471,023	25·8	39·3	27·3	0·32	0·33	1·02	0·09	1·22	0·17	0·40	0·17	2·07	0·04	0·90	6·9	13·5	1872
1873*	477,261	24·8	38·3	28·0	0·08	0·85	1·43	0·05	0·38	0·15	0·46	0·20	1·92	0·05	0·83	7·3	12·8	1873*
1874	483,582	23·8	39·3	28·7	0·05	0·62	1·33	0·07	0·83	0·08	0·39	0·19	1·71	0·01	0·94	7·3	13·5	1874
1875	489,987	24·2	39·5	28·4	0·11	0·54	0·92	0·14	0·88	0·11	0·44	0·12	1·32	0·01	1·12	8·4	13·3	1875
1876	496,476	20·2	40·0	28·0	0·80	0·65	1·13	0·10	0·81	0·16	0·42	0·17	1·50	0·02	1·05	7·4	14·4	1876
1877	503,051	19·8	39·5	26·1	0·36	0·59	1·05	0·13	0·84	0·11	0·29	0·12	0·82	0·01	0·86	7·9	14·9	1877
1878	509,714	18·8	39·7	26·8	0·01	0·45	1·07	0·14	0·68	0·06	0·31	0·10	1·42	0·07	0·91	7·6	14·4	1878
1879*	516,464	16·8	37·3	25·2	0·00	0·35	1·07	0·13	1·09	0·02	0·18	0·07	0·62	0·01	0·81	7·3	14·2	1879*
1880	523,304	17·2	36·9	25·0	0·01	0·63	1·03	0·14	0·76	0·04	0·26	0·07	1·73	0·09	0·80	7·1	13·7	1880
1881	530,051	17·8	35·9	22·8	0·03	0·29	0·34	0·09	0·71	0·03	0·17	0·06	0·73	0·02	0·84	8·1	15·9	1881
1882	536,324	18·8	35·7	24·0	0·05	0·89	0·34	0·11	0·87	0·10	0·25	0·04	1·00	0·03	0·67	7·2	14·5	1882
1883	542,671	17·8	34·9	24·4	0·01	0·71	0·81	0·11	0·62	0·05	0·20	0·03	0·95	0·03	0·73	7·0	15·5	1883
1884*	549,093	18·0	34·4	23·4	0·01	0·57	0·74	0·08	0·49	0·03	0·19	0·03	1·46	0·05	0·65	6·2	17·3	1884*
1885	555,591	17·0	34·8	23·6	0·08	1·08	0·17	0·10	0·71	0·04	0·17	0·01	0·64	0·02	0·69	6·4	16·4	1885
1886	562,166	16·4	34·7	24·1	0·00	0·27	0·41	0·15	0·57	0·03	0·29	0·01	1·34	0·04	0·71	7·2	17·0	1886
1887	568,819	16·6	33·9	25·4	0·01	1·54	0·63	0·23	0·50	0·02	0·31	0·01	1·19	0·02	0·77	6·9	16·1	1887
1888	575,550	16·0	33·3	23·3	0·07	0·27	0·42	0·36	0·79	0·02	0·33	0·02	0·71	0·01	0·74	6·7	18·3	1888
1889	582,362	17·0	33·1	24·2	0·00	1·22	0·45	0·51	0·45	0·01	0·31	0·01	1·00	0·03	0·89	6·5	18·2	1889
1890*	589,253	17·0	31·8	26·2	...	0·83	0·60	0·36	0·37	0·01	0·27	0·02	1·04	0·02	0·79	7·0	19·1	1890*
1891†	‡508,673	17·2	33·8	26·0	...	0·43	0·22	0·25	1·02	0·01	0·37	0·01	0·81	0·04	0·79	6·8	18·4	1891†
1892†	‡513,196	17·2	33·4	23·2	0·00	0·72	0·27	0·25	0·72	0·00	0·24	0·01	0·79	0·02	0·77	7·4	18·2	1892†
1893†	‡517,760	16·0	33·4	24·3	0·09	0·57	0·27	0·35	0·46	0·00	0·25	0·01	1·75	0·10	0·76	6·9	18·7	1893†
1894†	‡522,365	16·8	31·8	19·8	0·04	0·42	0·22	0·29	0·55	...	0·17	0·01	0·70	0·02	0·75	7·5	21·3	1894†
1895†	‡527,010	17·4	33·4	24·5	0·00	0·96	0·33	0·21	0·47	...	0·18	0·01	1·66	0·06	0·80	6·9	19.2	1895†

* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.

† The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

‡ These figures include a proportion of the inmates of certain Extra-municipal Institutions which receive patients from the City of Manchester, and are therefore in excess of the estimates of the Registrar-General.

TABLE G, 1881 TO 1895.—MANCHESTER.

ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

	Year	Annual Rates per 1,000 Persons living										Rates per 1,000 Births	
		Cancer	Tabes Mesenterica	Phthisis	Other Tuber: Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
Quinquennial Periods	1881–85	0·50	0·35	2·42	0·57	3·28	1·37	5·41	1·23	0·48	0·08	3·03	1·99
	1886–90	0·64	0·36	2·24	0·59	3·09	1·73	5·76	1·23	0·61	0·08	3·22	2·13
	1891–95	0·62	0·22	2·09	0·75	2·50	1·75	5·56	1·07	0·52	0·07	2·75	3·42
Average 15 years	1881–95	0·58	0·31	2·25	0·63	2·96	1·61	5·58	1·18	0·54	0·08	3·00	2·52
	1881	0·48	0·28	2·46	0·52	3·33	1·19	5·57	1·24	0·39	0·07	3·15	1·37
	1882	0·44	0·40	2·41	0·61	3·35	1·34	5·33	1·19	0·45	0·08	3·92	1·62
	1883	0·54	0·34	2·54	0·59	3·32	1·33	5·66	1·20	0·50	0·06	2·27	1·58
	1884*	0·51	0·39	2·34	0·56	3·27	1·44	4·88	1·23	0·59	0·10	2·81	2·55
	1885	0·51	0·36	2·34	0·56	3·12	1·53	5·59	1·28	0·49	0·08	3·05	2·84
	1886	0·56	0·43	2·44	0·59	3·30	1·53	5·43	1·26	0·57	0·08	2·67	1·85
	1887	0·62	0·39	2·19	0·53	3·17	1·66	5·72	1·23	0·53	0·08	3·58	1·35
	1888	0·65	0·31	2·14	0·62	3·19	1·72	5·31	1·16	0·62	0·10	4·12	1·77
	1889	0·70	0·36	2·12	0·59	2·94	1·79	5·06	1·28	0·64	0·08	3·06	1·87
	1890*	0·65	0·33	2·33	0·62	2·87	1·93	7·28	1·22	0·66	0·08	2·68	3·89
	1891†	0·63	0·25	2·20	0·78	3·10	1·89	6·77	1·03	0·55	0·07	3·08	4·01
	1892†	0·61	0·21	2·05	0·75	2·44	1·84	5·44	1·14	0·53	0·05	3·79	4·54
	1893†	0·59	0·26	2·05	0·76	2·51	1·66	5·53	1·20	0·53	0·07	3·70	3·94
	1894†	0·66	0·18	1·97	0·67	2·19	1·58	4·35	0·96	0·49	0·04	1·93	2·77
	1895†	0·63	0·22	2·16	0·77	2·28	1·79	5·73	1.04	0·49	0·11	1·25	1·82

* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

TABLE H, 1895.—Population, Area, Density. Total Births and Deaths, with Birth and Death Rates.

[Institution Populations, Births and Deaths, distributed.]

STATISTICAL DIVISIONS		Estimated Population	Area in Acres	Persons to an Acre	BIRTHS		DEATHS	
					Total	Rate per 1,000	Total	Rate per 1,000
	City of Manchester	**527,010**	**12,788**	**41**	**17,616**	**33·43**	**12,915**	**24·51**
I.	Manchester Township..	146,674	1,646	89	5,321	36·28	4,634	31·59
II.	North Manchester	136,166	7,191	19	4,421	32·47	2,659	19·53
III.	South Manchester	244,170	3,951	62	7,874	32·25	5,622	23·02
	(TOWNSHIPS)							
I.	Ancoats	46,242	400	116	1,831	39·60	1,438	31·10
	Central	36,957	748	49	1,144	30·95	1,228	33.23
	St. George's..............	63,475	498	128	2,346	36·96	1,968	31·00
II.	Cheetham	30,310	919	33	1,010	33·32	510	16·83
	Crumpsall	8,873	733	12	198	22·31	130	14·65
	Blackley	7,753	1,840	4	207	26·70	149	19·22
	Harpurhey	10,679	193	55	358	33·52	210	19·66
	Moston	6,102	1,297	5	201	32·94	108	17·70
	Newton Heath	36,138	1,350	27	1,147	31·74	736	20·37
	Bradford	22,030	288	76	806	36·59	533	24·19
	Beswick	10,417	96	109	374	35·90	212	20·35
	Clayton	3,864	475	8	120	31·06	71	18·37
III.	Ardwick	36,779	509	72	1,254	34·10	898	24·42
	Openshaw	28,603	581	49	963	33·67	597	20·87
	West Gorton	26,793	342	78	1,073	40·05	655	24·45
	Rusholme and Kirk. ...	18,832	1,396	13	411	21·82	298	15·82
	Chorlton-upon-Medlock	61,023	646	94	1,723	28·24	1,301	21·32
	Hulme.....................	72,140	477	151	2,450	33·96	1,873	25·96

TABLE J, 1895.

BIRTHS REGISTERED IN THE CITY OF MANCHESTER, IN ITS MAIN DIVISIONS, AND IN TOWNSHIPS; DISTINGUISHING LEGITIMATE AND ILLEGITIMATE BIRTHS: ALSO THE PROPORTION OF MORTALITY AMONG INFANTS OF BOTH CLASSES UNDER ONE YEAR OF AGE.

STATISTICAL AREAS	BIRTHS		Percentage of Illegitimate Births to Total Births	DEATHS UNDER 1 YEAR		PROPORTION OF DEATHS UNDER 1 YEAR PER 1,000 BIRTHS		
	Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
City of Manchester......	**17,616**	**817**	**4·64**	**3,566**	**323**	**202**	**193**	**395**
(DIVISIONS)								
I. Manchester Township	5,321	260	4·88	1,193	108	224	214	415
II. North Manchester......	4,421	120	2·71	777	51	176	169	425
III. South Manchester	7,874	437	5·55	1,596	164	203	193	375
(TOWNSHIPS)								
I. Ancoats	1,831	68	3·72	395	30	216	207	441
Central	1,144	104	9·09	276	38	241	229	365
St. George's	2,346	88	3·75	522	40	223	213	455
II. Cheetham	1,010	18	1·78	153	14	151	140	778
Crumpsall	198	19	9·60	40	5	200	196	263
Blackley..............	207	8	3·87	26	2	126	121	250
Harpurhey...........	358	7	1·96	77	7	215	199	1,000
Moston	201	6	2·99	16	...	80	82	...
Newton Heath	1,147	39	3·40	194	8	169	168	205
Bradford	806	16	1·99	182	13	226	214	813
Beswick...............	374	4	1·07	63	2	168	165	500
Clayton	120	3	2·50	26	...	217	222	...
III. Ardwick	1,254	47	3·75	242	15	193	188	319
Openshaw	963	30	3·12	213	14	221	213	467
Gorton (West)	1,073	40	3·73	224	17	209	201	425
Rusholme and Kirk.	411	23	5·59	75	8	182	173	348
Chorlton-on-Medlock	1,723	180	10·45	295	49	171	159	272
Hulme	2,450	117	4·77	547	61	223	208	521

TABLE K, 1895.

INFANTILE MORTALITY IN MANCHESTER CITY, AND ITS THREE MAIN DIVISIONS.

DEATH-RATES UNDER ONE YEAR PER 1,000 BIRTHS.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	202·43	224·21	175·75	202·69
Measles	5·51	4·89	4·07	6·73
Whooping Cough	5·28	6·58	4·98	4·57
Other Com: Infectious Diseases†	1·76	2·44	1·58	1·40
Diarrhœa	34·68	38·53	31·67	33·78
Tubercular Diseases‡	12·03	9·58	8·82	15·49
Convulsions	11·86	17·67	10·63	8·64
Other Nervous Diseases§	5·22	6·20	5·65	4·32
Lung Diseases	35·37	36·08	38·68	33·02
Wasting Diseases‖.................	54·89	59·20	39·58	60·58
Suffocation	0·11	0·19	...	0·13
Found dead in bed	6·53	9·78	3·17	6·22

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of "Fever," including the chief form of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and General Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

‖ These are Premature Birth, and such ill-defined cases as Atrophy, Marasmus, Debility, Inanition, &c.

TABLE L, 1895.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL AREAS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	24·51	31·59	19·53	23·02
Smallpox	0·00	...	...	0·01
Measles	0·96	0·94	0·70	1·11
Scarlet Fever	0·33	0·37	0·24	0·35
Typhus Fever	...	...	...	...
Whooping Cough	0·47	0·72	0·37	0·38
Diphtheria, Membranous Croup	0·21	0·16	0·37	0·16
Ill-defined Fever	0·01	0·02	0·01	...
Enteric Fever	0·18	0·18	0·16	0·19
Influenza	0·37	0·49	0·28	0·34
Diarrhœa, Dysentery	1·66	2·20	1·38	1.50
Erysipelas	0·07	0·10	0·07	0·06
Pyæmia	0·03	0·02	0·03	0·04
Puerperal Fever	0·04	0·04	0·06	0·03
Rheumatic Fever	0·06	0·03	0·05	0·09
Rickets	0·12	0·14	0·07	0·13
Cancer	0·63	0·74	0·47	0·66
Tabes Mesenterica	0·22	0·14	0·20	0·28
Hydrocephalus	0·35	0·40	0·27	0·37
Phthisis	2·16	3·29	1·30	1·97
Scrofula, Tuberculosis	0·42	0·46	0·24	0·50
Premature Birth	0·63	0·62	0·43	0·74
Old Age	0·45	0·65	0·37	0·37
Brain and Nervous Diseases	2·28	2·74	2·12	2·10
Heart Diseases	1·79	2·41	1·48	1·59
Bronchitis	2·63	3·99	2·17	2·08
Pneumonia	2·63	3·57	2·09	2·37
Respiratory Diseases (other)	0·47	0·52	0·48	0·43
Digestive Organs (Diseases of)	1·04	1·06	0·98	1·06
Urinary Organs (Diseases of)	0·49	0·61	0·43	0·44

TABLE M, 1895.—City of Manchester.—Annual Rates of Mortality at six Groups of Ages,* per 1,000 living at those age groups, from certain prevalent diseases, and groups of diseases.

Causes of Death	Under 5 Years	5 to 15 Years	15 to 25 Years	25 to 45 Years	45 to 65 Years	Over 65 Years
All Causes	87·74	4·48	5·19	12.06	36·33	120·95
Smallpox	0·02	...	...	...	0·01	...
Measles	7·29	0·19	...	0·01	...	...
Scarlatina	1·95	0·34	0.01	0·02	...	...
Diphtheria, Memb. Croup	1·32	0·21	0·01	...	...	...
Whooping Cough	3·62	0·09	...	...	...	...
Typhus	...	...	...	...	...	...
Fever .... Enteric	0·09	0·06	0·38	0·22	0·07	0·22
Continued	0·03	0·01	...	...	0·01	...
Diarrhœal Diseases	12·68	0·03	...	0·06	0·30	2·37
Tubercular Diseases	6·55	0·99	2·07	3·95	3·80	1·78
Brain	6·55	0·42	0·23	0·97	4·21	18·55
Heart	0·27	0·25	0·46	1·38	5·64	17·73
Diseases of ... Lungs	18·73	0·89	0·75	2·21	10·78	37·17
Digestive System	3·93	0·16	0·25	0·50	1·76	3·04
Urinary System	0·30	0·09	0·13	0·37	1·59	3·12
Other Diseases	24·40	0·74	0·90	2·37	8·17	36·95

* For death-rates at all ages, see Table L.

TABLE N, 1895.—ANNUAL RATES OF MORTALITY IN STATISTICAL DIVISIONS, AT SIX GROUPS OF AGES,* PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH		Under 5 Years			5 to 15 Years			15 to 25 Years		
		Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes		106·24	70·62	85·78	5·42	4·12	4·09	6·50	4·50	4·76
Smallpox		...	...	0·03	...	...	...	...	...	...
Measles		7·20	5·00	8·63	0·19	0·19	0·18	...	...	...
Scarlatina		2·18	1·52	2·05	0·40	0·13	0·42	...	...	0·02
Diphtheria, Memb. Croup		1·09	2·25	0·89	0·09	0·35	0·20	...	...	0·02
Whooping Cough		5·51	2·64	3·01	0·12	0·13	0·06	...	...	...
Fever	Typhus	...	...	...	...	...	...	...	...	...
	Enteric	0·05	0·17	0·07	0·03	0·06	0·07	0·44	0·40	0·34
	Continued	0·05	0·06	...	0·03	...	...	...	...	...
Diarrhœal Diseases		16·14	9·99	12·04	0·06	...	0·04	...	...	...
Tubercular Diseases		6·05	4·83	7·81	1·43	0·69	0·88	2·53	1·51	2·08
Diseases of	Brain	9·71	5·78	5·03	0·50	0·53	0·31	0·24	0·14	0·26
	Heart	0·33	0·34	0·20	0·22	0·22	0·29	0·62	0·43	0·38
	Lungs	22·36	17·57	17·04	1·31	0·91	0·61	1·20	0·54	0·60
	Digestive System	4·42	3·99	3·57	0·16	0·25	0·11	0·27	0·11	0·32
	Urinary System	0·44	0·28	0·23	0·12	0·03	0·11	0·07	0·32	0·06
Other Diseases		30·71	16·22	25·17	0·75	0·63	0·79	1·13	1·04	0·68

CAUSES OF DEATH		25 to 45 Years			45 to 65 Years			Over 65 Years		
		Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes		18·16	8·32	10·32	49·08	27·38	32·61	150·49	105·84	111·91
Smallpox		...	...	...	...	...	0·03	...	...	...
Measles		...	...	0·01	...	...	...	...	...	...
Scarlatina		0·05	0·03	...	...	...	...	...	...	...
Diphtheria, Memb. Croup		...	...	...	...	...	...	...	...	...
Whooping Cough		...	...	...	...	...	...	...	...	...
Fever	Typhus	...	...	...	...	...	...	...	...	...
	Enteric	0·26	0·13	0·23	0·05	0·06	0·09	...	...	0·45
	Continued	...	...	...	0·05	...	...	...	...	...
Diarrhœal Diseases		0·16	...	0·03	0·53	0·12	0·24	2·86	2·37	2·10
Tubercular Diseases		6·13	2·14	3·58	6·02	2·27	3·15	3·14	0·59	1·65
Diseases of	Brain	1·08	0·84	0·97	4·77	4·14	3·85	15·99	18·08	19·95
	Heart	1·87	1·33	1·11	7·85	4·08	5·00	22·84	16·60	15·45
	Lungs	3·77	1·49	1·65	16·42	7·86	8·64	55·97	28·76	31·20
	Digestive System	0·63	0·31	0·53	1·25	1·57	2·15	2.57	3·56	3·00
	Urinary System	0·80	0·26	0·18	1·69	1·57	1·52	2·00	1·78	4·35
Other Diseases		3·42	1·78	2·05	10·45	5·71	7·94	45·12	34·09	33·75

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* For death-rates at all ages, see Table L.

TABLE O, 1895.

MANCHESTER.—Certification of the Causes of Death in the Main Divisions and in Townships.

	Statistical Areas	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
						Certified by		
			Registered Medical Practitioners	Coroner		Regist'd Medical Prac-titioners	Coroner	Not Certified
	City of Manchester	**12,915**	**11,868**	**887**	**160**	**91·9**	**6·9**	**1·2**
	(divisions)							
	I. Manchester Township ...	4,634	4,181	385	68	90·2	8·3	1·5
	II. North Manchester	2,659	2,501	145	13	94·1	5·4	0·5
	III. South Manchester	5,622	5,186	357	79	92·2	6·4	1·4
	(townships)							
I.	Ancoats	1,438	1,292	113	33	89·8	7·9	2·3
	Central	1,228	1,096	115	17	89·2	9·4	1·4
	St. George's	1,968	1,793	157	18	91·1	8·0	0·9
II.	Cheetham	510	478	32	...	93·7	6·3	...
	Crumpsall	130	126	4	...	96·9	3·1	...
	Blackley	149	140	9	...	94·0	6·0	...
	Harpurhey	210	198	10	2	94·3	4·8	0·9
	Moston	108	101	7	...	93·5	6·5	...
	Newton Heath	736	689	42	5	93·6	5·7	0·7
	Bradford	533	510	19	4	95·7	3·6	0·7
	Beswick	212	192	19	1	90·5	9·0	0·5
	Clayton	71	67	3	1	94·4	4·2	1·4
III.	Ardwick	898	834	52	12	92·9	5·8	1·3
	Openshaw	597	563	30	4	94·3	5·0	0·7
	Gorton (West)	655	608	40	7	92·8	6·1	1·1
	Rusholme and Kirk. ...	298	278	20	...	93·3	6·7	...
	Chorlton-upon-Medlock	1,301	1,189	90	22	91·4	6·9	1·7
	Hulme	1,873	1,714	125	34	91·5	6·7	1·8

TABLE P, 1895.—Particulars as to Manchester Patients under treatment in the several Fever Hospitals during the year; also of Patients from Outside Districts sent to Monsall and Clayton during the same Period.

Disease	Hospital	In Hospital commencement of year	Admitted	Discharged	Died	Remaining in Hospital close of year
Smallpox	Monsall and Clayton Hospitals	...	50	48	2	...
	Total	...	50	48	2	...
Scarlet Fever ...	Monsall	285	1,512	1,379	114	304
	Pendlebury	25	119	109	14	21
	Other Hospitals.........	...	3	2	1	...
	Total	310	1,634	1,490	129	325
Diphtheria	Monsall	10	67	63	12	2
	Pendlebury	...	...	...	...	...
	Other Hospitals	...	2	1	1	...
	Total	10	69	64	13	2
Enteric Fever ...	Monsall	25	201	160	34	32
	Pendlebury	...	...	...	...	...
	Other Hospitals	1	22	14	8	1
	Total	26	223	174	42	33
Typhus Fever	Monsall	...	...	...	...	...
	Pendlebury	...	...	...	...	...
	Other Hospitals	...	...	...	...	...
	Total	...	...	...	...	...
Other Acute Diseases	Monsall	9	217	181	38	7
	Pendlebury	...	2	2	...	...
	Other Hospitals	...	6	6	...	...
	Total	9	225	189	38	7
All Diseases...........................		355	2,201	1,965	224	367

Patients sent to Monsall and Clayton, from Districts Outside the City, during the year 1895.

Disease	Withington	Stretford	Moss Side	Swinton &c	Sale	Prestwich	Gorton	Failsworth	Other Districts
Smallpox	...	...	...	...	...	...	1	4	3
Scarlatina	40	49	31	47	6	4	9	36	...
Diphtheria	4	2	...	2	5	...	1	1	2
Enteric Fever	4	11	3	2	...	...	15	3	1
Other Diseases..............	4	2	2	28	1	1	1	1	15

TABLE Q, 1895.—WORK OF SANITARY DEPARTMENT FOR THE YEAR.

		TOWNSHIPS																		
		Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	TOTAL
Complaints to Sanitary Superintendent ...		1,488	978	1,058	407	249	15	95	30	418	1,011	334	84	554	248	357	48	1,022	1,071	9,467
Inspections of	Dwelling-houses	7,814	4,815	8,243	3,348	1,142	335	1302	957	2,566	425	386	1,858	2,222	2,398	1,260	2,421	3,468	7,446	52.406
	Newly-infected Dwelling-houses	224	179	352	212	46	31	45	38	235	127	69	26	301	147	164	82	268	437	2,983
	Cellars..	348	13	44	...	...	...	...	...	...	59	59	...	1	...	...	...	...	1	525
	Schools	15	4	25	1	1	4	...	2	21	7	4	...	6	16	1	8	23	20	158
	Ships	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	26
	Factories and Workshops	116	276	46	24	1	...	...	...	11	...	...	...	1	15	6	...	37	17	550
	Lodging-houses	547	163	585	424	...	...	...	...	39	26	23	...	33	3	5	8	51	197	2,104
	Offensive Trades	55	14	20	16	7	...	7	7	76	27	5	44	31	29	1	...	3	18	360
	Dairies and Milkshops.....................	250	38	548	341	36	78	15	65	342	90	24	66	140	162	98	370	367	478	3,508
	Bakehouses	304	336	213	273	12	36	34	...	91	87	61	3	116	80	64	80	299	437	2,526
	Canal Boats	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2.159
	Slaughter-houses	...	...	...	...	1	...	...	...	10	...	...	2	2	...	2	120	...	2	139
	Tips for Refuse................................	...	2	6	...	42	10	124	68	42	5	...	...	...	45	...	...	...	...	344
	Miscellaneous Inspections	1,926	2,055	2,447	782	203	19	396	565	2,103	308	114	802	459	936	615	860	850	1,016	16.456
	Factories and Workshops by Shop Hours, &c., Inspectors..................	1,247	5:756	788	1,558	19	61	79	6	219	97	57	11	482	182	191	225	1,690	1.335	14.003
	Shops by Shop Hours, &c., Inspectors	331	1,027	558	602	14	53	111	...	121	136	125	...	246	222	135	101	414	593	4,789
Re-inspections of Infected Dwelling-houses		783	434	1,030	734	146	60	121	100	841	374	193	228	699	649	271	296	524	1,285	8.768
Rooms Fumigated after Infectious Disease		469	399	930	389	41	24	29	79	610	232	145	69	610	542	363	140	438	564	6.073
Drains Tested by Smoke Machine............		188	251	34	1	1	...	10	...	29	3	...	...	...	...	3	5	129	570	1.224
Smoke Abatement	Observations made	307	454	68	72	38	13	3	3	100	39	10	36	94	73	103	21	71	127	1,632
	Proceedings before Magistrates	4	35	1	2	...	...	...	...	6	...	...	1	17	6	3	2	15	3	95
Food Adulteration	Samples Collected for Analysis	201	161	152	66	14	7	22	12	126	65	40	11	155	94	114	36	182	187	*1,251
	Proceedings before Magistrates	5	34	13	4	...	5	...	...	3	1	...	...	4	7	...	...	6	9	91
Ashpits reported to Cleansing Department for emptying		464	19	1	33	758	113	435	296	1,472	768	13	453	2	422	261	421	73	13	6,017
Receptacles reported to Cleansing Department for emptying..............................		1,000	82	519	1,288	15	3	41	1	156	127	243	...	12	...	2	20	259	45	3,813
Notices issued for Abatement of Nuisances.		1,069	1,187	1,798	1,236	238	168	183	79	714	314	122	149	555	529	431	400	1.327	1,793	12.292
Letters written for Abatement of Nuisances		51	46	69	65	26	2	19	4	34	21	9	9	12	20	31	32	39	40	529
Reports made to Medical Officer of Health		1,033	1,194	1,866	663	221	139	235	176	758	794	386	50	1,857	939	1,390	1,224	2,246	3,130	18,301
Legal proceedings taken		57	27	57	15	3	...	1	...	...	1	5	...	1	1	3	4	26	49	250
Total Nuisances abated		876	610	1,640	1,019	221	158	185	64	671	284	172	132	475	538	332	378	1.013	1.436	10,204
Number of Cottages under Five Rooms...		7,435	4,964	9,037	729	522	923	688	367	4,409	2,621	1,285	402	4.552	3.510	3,221	826	3.805	8,167	57.463

* Six samples procured outside the City.

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